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The Effects of Repeated Reading Practice on Reading Strategies of First Grade Readers

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THE EFFECTS OF REPEATED READING PRACTICE ON READING STRATEGIES OF FIRST GRADE READERS

by

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VITA

The author, John Francis Rowan, is the son of the late John Rowan and Alice (Rowan) Creedon and the husband of Mary Ann Rowan. He is also the father of Kevin and Daniel Rowan. John was born February 16, 1948, in Evergreen Park, Illinois.

John received his elementary education at St. John Fisher and St. Barnabas schools in Chicago, Illinois. His secondary education was completed at St. Ignatius High School, Chicago, Illinois, in June of 1966.

In December, 1971, John received the Bachelor of Arts degree with a major in Political Science, from Loyola University of Chicago. While attending Loyola University, John became a member of Tau Kappa Epsilon Fraternity.

John received the Master of Science in Education degree, with a major in Teaching of Reading, from Chicago State University in 1973. While attending Chicago State University, he was elected a member of Phi Delta Kappa.

From 1971 to 1980, John served as a teacher in the Chicago Public Schools, in several elementary grades and in a Center for Learning Disabilities. During these same years, he served also as a part-time instructor for Chicago State University and Loyola University, teaching courses

concerned with reading instruction for professional educators. In 1976, John began his doctoral studies in the Department of Curriculum and Instruction of Loyola University.

In the spring of 1980, John founded a training and development consulting firm, for which he currently serves as president. In 1981, he was selected as one of the Outstanding Young Men of America. John presently resides with his family in South Bend, Indiana, where he is a member of the Rotary Club and the Chamber of Commerce.

TABLE OF CONTENTS

Page

LIST OF TABLES

Table Page

Table Page

Table Page

Table Page

Table Page

CONTENTS OF APPENDICES

CHAPTER I

INTRODUCTION

Reading instruction is formally initiated for most American children in first grade. For many first grade children, the learning demands presented by reading instruction are formidable. Learning to read requires that children have some notion of the reading process, at least an idea that marks on a page can in some manner be translated into a sensible message. The children must gradually learn to differentiate these marks, recognize that the marks represent speech sounds, and realize that the marks can be combined to form printed words. These marks -- letters, spaces, punctuation -- provide graphic information which may be helpful to first grade children who are learning to read.

In order to progress from the graphic information to a sensible message, however, first graders must recognize or learn that the graphic information is printed language. The children must realize that printed language, although different in format and style, is very similar in purpose, function, and operation to the spoken language with which they are already familiar. This realization may enable

first grade children to draw upon another source of help for learning to read -- contextual information.

Contextual information consists of cues provided by syntax, or language structure, and by semantics, or meaning. Printed language, like the spoken counterpart, is constrained by syntax and semantics. Relatively few basic sentence structures are used to convey meaning; within any given context, only a narrow range of meaning is possible. First grade children must be able to use their implicit understanding of English syntax and semantics, gained through experience with speech, as a basis for processing an author's graphic symbols.

The manner in which children attempt to integrate graphic and contextual information is of particular interest. Ryan and Semmel observed that integration of graphic and contextual information is one characteristic of mature reading.[1] Other authors have advocated that reading instruction from the beginning should encourage children to integrate graphic, syntactic, and semantic information in reading.[2] Evidence exists, however, which suggests that differences among children in ability to effectively com-

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[1] E. B. Ryan and M. I. Semmel, "Reading as a Constructive Language Process," Reading Research Quarterly, V (1969): 59-83.

[2] Linnea C. Ehri, "Beginning Reading from a Psycholinguistic Perspective: Amalgamation of Word Identities," in The Recognition of Words, ed. Frank B. Murray (Newark: International Reading Association, 1978), pp. 1-33; and Eleanor J. Gibson and Harry Levin, The Psychology of Reading (Cambridge: MIT Press, 1975), p. 285.

bine graphic and contextual cues can be identified as early as first grade. Several investigators, through analysis of oral reading errors, have observed developmental patterns in first grader's use of graphic and contextual information.[3]

These studies of oral reading errors indicate that beginning readers experience difficulty with integration of graphic and contextual information. Children must eventually, however, learn the optimal balance in the use of graphic information and contextual information.[4] Perhaps, for less able first graders, use of graphic detail for word recognition is not yet automatic; in other words, individual word recognition may require the reader's attention, thereby inhibiting integration of graphic and contextual information.[5] Clay observed, for example, that less able beginning readers made error responses with such frequency that use of contextual information for correction of errors

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[3] A. J. Biemiller, "The Development of the Use of Graphic and Contextual Information as Children Learn to Read," Reading Research Quarterly, VI (1970): 75-96; Rose-Marie Weber, "A Linquistic Analysis of First Grade Errors," Reading Research Quarterly, V (1970): 428-451; Rose-Marie Weber, "First Graders' Use of Grammatical Context in Reading," in Basic Studies on Reading, ed. Harry Levin and J. P. Williams (New York: Basic Books, 1970), 147-163; and Alice S. Cohen, "Oral Reading Errors of First Grade Children Taught a Code Emphasis Approach," Reading Research Quarterly, X (1975): 616-650.

[4] Weber, "Linguistic Analysis," p. 448.

[5] David LaBerge and S. Jay Samuels, "Toward a Theory of Automatic Information Processing in Reading," in Theoretical Models and Processes of Reading, ed. Harry Singer and Robert B. Ruddell (Newark: International Reading Association, 1976), pp. 548-579.

was often impossible.[6]

Schwartz proposed an alternate explanation for the apparent inability of less able beginning readers to integrate graphic and contextual information. According to this explanation, the less able reader may exhibit a strategic deficit, that is a failure to plan or exercise control over skill use in situations which require a strategy. The author, referring to results of investigations by Biemiller[7] and Weber,[8] observed that for the more able readers in these studies attention to graphic detail became an additional aspect of a decoding strategy already subordinate to comprehension. Less able readers, on the other hand, probably increased their attention to graphic information as a direct result of instruction at the expense of monitoring context.[9] Goodman[10] and Smith[11] have emphasized that strategies for effective use of graphic and con-

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[6] Marie M. Clay, "Reading Errors and Self-Correction Behavior," British Journal of Educational Psychology, XXXIX (1969): 47-56.

[7] Biemiller, pp. 75-96.

[8] Weber, "Linguistic Analysis," pp. 428-451.

[9] Robert M. Schwartz, "Strategic Processes in Beginning Reading," Technical Report Number 15 (Bolt, Beranek, and Newman, Inc., Cambridge, Masschusetts; Illinois University, Urbana), Center for the Study of Reading (1976).

[10] Kenneth Goodman, "Behind the Eye: What Happens in Reading," in Theoretical Models and Processes of Reading, ed. Harry Singer and Robert B. Ruddell (Newark: International Reading Association, 1976), pp. 470-496.

[11] Frank Smith, Understanding Reading (New York: Holt, Rinehart, and Winston, 1978), p. 149.

textual information develop from reading increasing amounts of contextual material. While reading in context, the beginning reader can use his language knowledge and his conceptual background as a framework for use of graphic information.[12] These authors have suggested that until the child can read independently, he must be helped to read.

The method of repeated reading appeared to provide a means for assisting children to read connected discourse rather than isolated words or fragmented material. The method (which has been referred to alternately as assisted reading, reading while listening, and memorization of text) has been described independently by Dahl,[13] Hoskisson,[14] and Chomsky.[15] In general, the method requires that a student reread a passage of text until he is able to read the passage orally with fluency. Upon achievement of the fluency criterion, the student repeats the procedure with a new passage. Rereading practice may be undertaken by the

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[12] Kenneth Goodman, "Reading: The Key is in Children's Language," The Reading Teacher, XXV (1972): 505-508.

[13] Patricia J. R. Dahl, "An Experimental Program for Teaching High Speed Word Recognition and Comprehension Skills," Final Report (Bloomington Public Schools, Minnesota), National Institute of Education, Washington, D.C. (1974).

[14] Kenneth Hoskisson, "Successive Approximation and Beginning Reading," Elementary School Journal, LXXV (1975): 442-451.

[15] Carol Chomsky, "After Decoding: What?" Language Arts, LIII (1976): 288-296, 314.

student with relative independence,[16] with intermittent teacher assistance,[17] or with access to an audio-taped rendition of the passage.[18] Word recognition errors may be recorded while the student is reading orally.[19] The fluency criterion may be reading rate,[20] word recognition accuracy,[21] or smooth and expressive reading.[22]

According to Dahl,[23] and Samuels,[24] the repeated reading method emerged largely from implications of the theory of automatic information processing in reading. Automaticity theory posits that during the execution of a complex skill, such as reading, many component processes must be coordinated within a very short period of time. If each component process requires attention, the capacity of attention will be exceeded, and performance of the complex

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[16] Dahl, p. 6.

[17] Hoskisson, p. 445.

[18] Chomsky, p. 290; Kenneth Hoskisson and Bernadette Krohm, "Reading by Immersion: Assisted Reading," Elementary English, LI (1974): 832-836; and Bonnie Lee Miller, "Assisted Reading as a Remedial Reading Technique at the High School Level: A Psycholinguistic Evaluation," (Ph.D. dissertation, Virginia Polytechnic and State University, 1977).

[19] Dahl, p. 7; and S. Jay Samuels, "The Method of Repeated Readings," The Reading Teacher, XXXII (1979): 403-408.

[20] Dahl, p. 7; and Samuels, p. 404.

[21] Miller, p. 19.

[22] Chomsky, p. 291.

[23] Dahl, p. 10.

[24] Samuels, p. 403.

skill will be impeded. If, on the other hand, enough of the components can be processed and coordinated automatically, then the load on attention will be within tolerable limits and the complex skill can be successfully performed. The development of automaticity results from practice. LaBerge and Samuels believed that for perceptual learning, repetitions promote not only automatic perceptions and coordinations among perceptions, but also reorganization of perceptual units into higher-order units. While a child reads text from a typical basal reader, for example, in which the same vocabulary is repeated frequently, the repetitions will promote automatic recognition of each word unit. As automatic recognition of word units develops, the child begins to organize the words into groups or phrases. Additional repetition can then foster automatic recognition of these groups or phrases, as well as strengthen recognition of the word units.[25]

The fluent reader, according to Samuels, decodes text automatically, without attention. Attention then may be directed toward comprehension. The beginning reader, in contrast, must attend to decoding. Since the capacity of attention is limited, the beginning reader may experience difficulty with comprehension. Samuels maintained that repeated reading provides the practice necessary for advancement from accuracy in word recognition (where attention is required), to automaticity in word recognition

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[25] LaBerge and Samuels, p. 576.

(where attention may be focused on comprehension). The author reported that with successive rereadings of a passage, word recognition requires less attention, fluency increases, and attention may be increasingly devoted to deriving meaning.[26] Both Samuels[27] and Dahl[28] observed that repeated practice is common in learning of complex psychomotor activities, such as sports or the study of musical instruments. Such complex activities consist of many subskills, mastery and integration of which initially require a great deal of attention. With repetitive practice, the subskills and their coordinations become automatic.

Chomsky referred to repeated reading practice as memorization of text. With this version of repeated reading, the child listens to a tape recorded story while simultaneously following along in the written text. The procedure is repeated with the same story until fluency in oral reading is achieved. The text memorization technique developed from the author's observation that learning to read requires the active participation of the learner. Chomsky believed that the text memorization technique would both hold the learner's attention, and provide printed inputs in large quantity and accessible form, so that the learner's mind would be engaged in interacting with the

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[26] Samuels, p. 405.

[27] Ibid.

[28] Dahl, p. 10.

print. The author noted that memorization of books is common among very young children who are read to frequently, and indeed often contributes to early reading. In addition, the author discussed parallels between text memorization as an aid to reading improvement and the environment in which a child develops speech. As he develops language, the child is continuously surrounded by speech. From a massive variety of inputs, he engages in an active process of selecting the information needed to build his language. The child interacts with other speakers as he analyzes, organizes, formulates and tests hypotheses, and adjusts to new information. Speech development occurs naturally, according to Chomsky, if a child is exposed to a rich, stimulating language environment. The text memorization technique, in the opinion of the author, appeared to provide for children who are learning to read an environment rich in inputs with which he may interact, in a manner similar to that of the interactive environment characteristic of speech development.[29]

Another version of the repeated reading method has been described by Hoskisson as assisted reading. In assisted reading, an adult reads aloud phrases or sentences in a story one at a time, and the child repeats each phrase or sentence after the reader. This procedure continues throughout the story, or a story may be read and reread a page at a time. The author has characterized three stages

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[29] Chomsky, pp. 288-296, 314.

in assisted reading.

The first stage consists of reading to the child and having him repeat the phrases or sentences. Initially, the child appears to attend more to repeating the words than to the lines of print. Chomsky observed a similar tendency in the initial phase of text memorization.[30] Attention to print gradually increases. During the first stage, the child reads many stories, and rereads most of them. When the child begins to recognize words from story to story, he enters the second stage of assisted reading. The procedure followed in stage two is similar to that in the first stage, except that the adult reader reads most of the words and the child reads those words which he can recognize. The flow of reading is not interrupted, so that the child can make full use of syntactic and semantic information. Stage three begins when the child requests to read most of the words himself. The adult reader supplies the words which the child cannot recognize, in a manner such that fluency is maintained.[31]

Assisted reading was developed, according to Hoskisson, from the idea of successive approximation in language development. Successive approximation suggests that children learn language in a series of stages which gradually approach replication of adult language in the speech community. In a similar fashion, children learning to read

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[30] Chomsky, p. 292.

[31] Hoskisson, pp. 442-451.

may proceed through a series of approximations which gradually approach the fluency of skilled reading. The author observed that each child has a set for diversity and a set for pattern search. The set for diversity enables the child to process the syntactic diversity of language, and the set for pattern search enables the child to look for patterns in language. If complete context is provided in the reading situation, the child will be able to use the full power of his language. He will, according to the author, discover the orthographic regularities of the written language only if he is provided with complete stories that are truly representative of the writing system. In other words, concluded Hoskisson, the child should be immersed in reading in a manner similar to the environment in which he learned to speak -- an environment in which the child was immersed in speech. Immersion in reading, then, would allow the child first to formulate the most comprehensive rules concerning the nature of reading, and later to develop the more complex aspects of reading.[32]

Many first grade readers encounter considerable difficulty in attempting to integrate graphic and contextual information. Since the method of repeated reading appears to facilitate integration of graphic and contextual cues, further investigation of the effects of the method on first graders' reading strategies seems warranted.

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[32] Ibid.

Definition of Terms

Strategy, in the present study, refers to the manner in which the reader translates print to speech.

Fluency, in the present study, refers to oral reading which was characterized by rate appropriate to difficulty of material, and minimal word recognition errors. Based upon results of a pilot study using materials and subjects similar to those for the present investigation, the fluency criterion was set at one hundred words per minute.

Graphic Information, in the present study, refers to cues available to the reader from printed symbols on the page.

Contextual Information, in the present study, refers to cues available from the reader's implicit or explicit knowledge of English syntax and semantics.

Purpose of the Study

This study attempted to determine the effects on use of reading strategies by first grade readers, when regular reading instruction was supplemented by repeated reading practice. Specifically, this study analyzed oral reading errors made by first grade readers whose regular basal reader instruction was supplemented by rereading of text material for increased fluency and comprehension. In addition, the effects of repeated reading practice on sight vocabulary growth and oral reading fluency were also examined. This study additionally attempted to detect any differential effects of repeated reading practice on reading

strategies of more able and less able beginning readers.

The analysis of oral reading errors focused on changes in a) use of graphic information, and b) use of contextual information. Successive monthly samples of oral reading errors on two different contextual presentations were examined. The two contextual presentations were selected from basal material and supplementary material. Sight vocabulary growth was assessed with the Johnson Basic Sight Vocabularly Test.[33] Changes in oral reading fluency were measured with the Gray Oral Reading Tests.[34]

Limitations of the Study

The following were considered to be limitations of this study:

1. Although subjects were randomly assigned to groups and groups were randomly assigned to treatment levels, the classes used represented intact groups from a single school.

2. This study focused only on reading strategies as inferred from oral reading errors. It did not attempt to equate oral reading performance with silent reading performance.

3. No attempt was made to directly assess subjects' understanding of the passages read orally.

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[33] Dale D. Johnson, Johnson Basic Sight Vocabulary Test (Lexington: Personnel Press, 1976).

[34] William S. Gray, Gray Oral Reading Tests (Indianapolis: The Bobbs-Merrill Company, 1967).

4. This study focused only on the first year of instruction and the reading strategies which emerged within that period.

CHAPTER II

REVIEW OF RELATED LITERATURE

Among the skills to be acquired by the novice reader, those which involve recognition of printed words are of central importance.[1] Thus, a significant portion of initial reading instruction is designed to foster development of word recognition skills. The following literature review focuses on cues used by beginning readers, under different instructional conditions, for learning and remembering words. In addition, the influence of instruction on beginning readers' strategies for identifying unfamiliar words is discussed. Subsequently, evidence is reviewed which bears on beginning readers' use of graphic information in concert with contextual information for reading connected discourse. Finally, research concerning the effects of repeated reading practice on attention to graphic detail and reading of connected discourse is reviewed.

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[1] Linnea C. Ehri, "Beginning Reading from a Psycholinquistic Perspective: Amalgamation of Word Identities," in The Recognition of Words, ed. Frank B. Murray (Newark: International Reading Association, 1978), p. 1-33; and Robert B. Ruddell, "Psycholinquistic Implications for a Systems of Communication Model," in Theoretical Models and Processes of Reading, ed. Harry Singer and Robert B. Ruddell (Newark: International Reading Association, 1976), pp. 452-469.

Development of Attention to Graphic Detail by Beginning Readers

A printed word has been defined as a complex of features, a composite representation of five classes of information[2] or identities:[3] graphic, phonological, orthographic, semantic, and syntactic. According to Ehri, the beginning reader has acquired all but the graphic identities for many words as a consequence of achieving competence with spoken language. One important task, then, for the novice reader is to amalgamate a word's other identities with its graphic form, so that a glance at the word triggers recognition of all its relevant aspects.[4]

Ehri proposed that amalgamation of graphic identities with other word identities is accomplished by formation of cognitive-linguistic structures or rules, which capture regularities within the printed language system. These rules, which result from the child's continuing encounters with printed language, are restructured as their strengths and limitations are discovered.[5]

Gibson and Levin[6] shared with Ehri[7] the belief that word recognition learning is characterized by rule-induc-

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[2] Eleanor J. Gibson and Harry Levin, The Psychology of Reading (Cambridge: MIT Press, 1975), p. 194.

[3] Ehri, pp. 1-33.

[4] Ibid.

[5] Ibid.

[6] Gibson and Levin, p. 204.

[7] Ehri, pp. 1-33.

tion. Little is known, however, about how rules are induced or about the regularities in printed language to which the child must attend.[8]

Several authors have speculated that the child's cognitive-linguistic rules for learning printed words involve establishment of criterial sets of distinctive features for word discrimination. Distinctive features are established as the child discovers cues useful for distinguishing one word from another.[9] Barr, for example, in a reanalysis of Wiley's[10] data, found that when children are taught by a sight-word emphasis, they appear to develop an integrated and stable cognitive structure around the printed words which they experience. Cognitive structures may develop from information about word shapes, length, or initial and final letters. These features of words together with their oral counterparts are stored and organized by the beginning reader, and used for discriminating one word from another.[11]

Marchbanks and Levin conducted a study to determine which cues are used by children for remembering words.

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[8] Gibson and Levin, p. 204; and Frank Smith, Understanding Reading (New York: Holt, Rinehart, and Winston, 1978), p. 146.

[9] Gibson and Levin, p. 198; and Smith, p. 144.

[10] Will E. Wiley, "Difficult Words and the Beginner," The Journal of Educational Research, XVII (1928): 278-289.

[11] Rebecca Barr, "Processes Underlying the Learning of Printed Words," Elementary School Journal, LXXV (1975): 258-268.

Subjects were fifty kindergarten children and fifty first grade children. The investigators used a delayed-recognition task with three-letter and five-letter nonsense words. Each subject was shown a nonsense word on a stimulus card and the card was withdrawn from sight. Then the subject was asked to pick out the word just seen, or the one most like it, from a group of nonsense words randomly arranged on a response card. Each item on the response card contained one cue from the word on the stimulus card. The cues examined were word shape, and letters in various positions within the word. Results indicated that the most salient cue for remembering words was the first letter of a word. The final letter of a word was the second most utilized cue, and word shape was the least salient cue.[12]

Barr, however, suggested that different instructional methods influenced differentially the manner in which children use printed symbols for word recognition. The investigator examined reading errors on isolated words made by first grade subjects taught by two instructional methods. When children were instructed by a sight-word method, most words erroneously substituted for text words came from the sample of words taught at the same time. Most errors made by the sight-word subjects were real word substitutions, which rarely shared the initial letters of stimulus words. In contrast, substitution errors made by children taught by

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[12] G. Marchbanks and H. Levin, "Cues by Which Children Recognize Words," Journal of Educational Psychology, LVI (1965): 57-61.

a phonics method were frequently non-words, which often corresponded in initial letters with stimulus words. Errors made by phonics subjects were less likely to be constrained by words which had been taught.[13]

In a later related study, Barr found that children's strategies for translating print to speech (as inferred from error patterns) remained stable through first grade. Children taught by a phonics method, however, appeared to increase their attention to graphic detail. The substitution errors of these children typically shared two letters with stimulus words, were often non-words, and were not usually words from the instructional set. Children taught by a sight-word method produced more real word substitution errors which were highly constrained by the instructional set, and which infrequently shared more than one letter with stimulus words. Only the most able readers taught by a sight-word method showed signs of incorporating a phonics strategy by the end of first grade.[14]

Samuels argued that, in initial reading instruction, a decision must be made whether to foster speed of initial learning or transfer. Sight-word methods appear to promote relatively fast learning of highly discriminable words. Children can learn to recognize such words on the basis of

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[13] Rebecca Barr, "The Influence of Instructional Conditions on Word Recognition Errors," Reading Research Quarterly, VII (1972): 509-529.

[14] Rebecca Barr, "The Effect of Instruction on Pupil Reading Strategies," Reading Research Quarterly, X (1975): 555-582.

initial or final letters, or shape. Such cues, however, according to Samuels, have little transfer value for learning new words.[15]

In order to develop strategies for identifying new words the child must learn, according to Gibson and Levin, 1) to attend to graphic information as well as to meaning; 2) to become aware of the correspondence rules that link the phonological to the orthographic system; 3) to analyze intraword relations so that transfer to new words may occur; and 4) to recognize that structures of words are related, knowledge of which provides economy of processing.[16] Smith believed that the child must employ "identification by analogy," a strategy which involves searching for cues to a word's pronunciation and meaning on the basis of familiar words similar in appearance to the unfamiliar word.[17]

Samuels and Jeffrey found that transfer to reading new words in isolation was enhanced when children were trained to identify words highly similar in appearance. Subjects included thirty-six kindergarten children and twenty-four nursery school children. An artificial alphabet was used to construct two-letter words with English

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[15] S. Jay Samuels, "Modes of Word Recognition," in Theoretical Models and Processes of Reading, ed. Harry Singer and Robert B. Ruddell (Newark: International Reading Association, 1976), pp. 270-282.

[16] Gibson and Levin, p. 276.

[17] Smith, p. 146.

auditory equivalents. Three lists of two-letter words were constructed: four two-letter words constructed from only four different letters; four two-letter words constructed from six letters; and four two-letter words constructed from eight letters. Subjects were randomly assigned to training on one of the three lists. On each card used for the transfer test, one of the artificial letters from previous training was replaced with a letter not seen before. On the transfer test, subjects trained on two-letter words constructed from eight letters made a significantly larger ($p<.02$) number of false identifications than did subjects trained on two-letter words constructed from four letters.[18]

The results of a later related study suggested that training on grapheme-phoneme associations facilitated transfer to reading new words presented in isolation. Sixty kindergarten children were randomly assigned to one of three groups: single-letter training, whole word training, and a control group. Eight two-letter words with English auditory equivalents were constructed from six graphemes, using an artificial alphabet. In stage one, all groups received left-to-right reading training and phonic blending training. During stage two, the single-letter group received training in associating each grapheme with a verbal response. The whole word group, in stage two, was

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[18] S. Jay Samuels and W. E. Jeffrey, "Discriminability of Words, and Letter Cues Used in Learning to Read," Journal of Educational Psychology, LVII (1966): 337-340.

trained to associate a verbal response with each whole word. Transfer of training, as well as knowledge of grapheme-phoneme associations, was examined. Subjects who received single-letter training required significantly fewer ($p<.01$) trials to reach criterion on the transfer task than did the whole word group. On the test of knowledge of grapheme-phoneme associations, the single-letter group performed significantly better than did the whole word and control groups ($p<.01$). The performance of the whole word group did not differ significantly from that of the control group.[19] The investigators concluded, on the basis of these studies, that transfer of word recognition training is clearly enhanced when children are forced to attend to all of the letters of words used in training. This can be best accomplished either by training on words which are highly similar in appearance, or by training on grapheme-phoneme correspondences.

Samuels advocated that initial reading instruction should emphasize mastery of decoding subskills. The author believed that complex tasks such as reading are comprised of lower-order skills, mastery of which may facilitate attainment of the final task. In addition, concern for decoding subskill mastery appears to facilitate transfer to recognition of new words. Samuels further argued that

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[19] W. E. Jeffrey and S. Jay Samuels, "Effect of Method of Reading Training on Initial Learning and Transfer," Journal of Verbal Learning and Verbal Behavior, VI (1967): 354-358.

decoding subskill approaches attempt to reduce the number of children who will experience difficulty with reading by focusing on prerequisite skills before problems arise.[20] Evidence exists, however, which suggests that some reading difficulties may stem not so much from a failure to master decoding subskills, as from failure to coordinate or integrate subskill use.

Guthrie, for example, compared acquisition of phoneme-grapheme association subskills by normal and disabled readers. Nineteen normal readers (mean age, seven years) were matched with nineteen disabled readers (mean age, nine years and two months) on reading comprehension and intelligence test scores. All subjects were given the entire battery of fifteen subtests from the Kennedy Institute Phonics Test. For computation of subtest intercorrelations, eight of the fifteen subtests were selected. These eight subtests were selected because they were highly reliable and, in the investigator's opinion, they provided a cogent basis for evaluation of subskill models. Results indicated that the normal readers had acquired skills in different levels of strength, from about ninety percent for single-letter sound production to about twenty-five percent for long vowel production. For normal readers, subskills were highly intercorrelated. Disabled readers exhibited a pattern

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[20] S. Jay Samuels, "Hierarchical Subskills in the Reading Acquisition Process," in Aspects of Reading Acquisition, ed. John T. Guthrie (Baltimore: John Hopkins University Press, 1976), pp. 162-179.

of skill acquisition remarkably similar to that of normal readers. However, subskill intercorrelation for the disabled readers was very low. The investigator reasoned that for the disabled readers the subskills are distinct components; whereas the subskills are highly integrated for the normal readers.[21]

Cohen analyzed oral reading errors made by first graders who were taught by a phonics method. Included in the investigator's discussion was the observation that letter-sound association appears to be a relatively low level skill, which may not serve well to distinguish more able and less able readers. Understanding of skill application apears to be the more complex process.[22]

Summary

The preceding review suggests that word recognition learning presents a formidable task to the beginning reader. To succeed in learning to discriminate among printed words, and in learning to identify unfamiliar words, the child apparently must internalize rules about printed language. These rules, for the most part induced by the child himself, apparently are formulated as a result of the manner in which a child perceives words. The child's per-

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[21] J. T. Guthrie, "Models of Reading and Reading Disability," Journal of Educational Psychology, LXV (1973): 9-18.

[22] Alice S. Cohen, "Oral Reading Errors of First Grade Children Taught a Code Emphasis Approach," Reading Research Quarterly, X (1975): 616-650.

ceptions of words, in turn, may be influenced by instructional methods. Sight-word methods appear to foster word recognition strategies which reflect minimal attention to graphic detail. Children taught by sight-word methods apparently use such graphic features as initial or final letter, or word shape, for discrimination among words as well as for identification of new words. Furthermore, responses to printed words, for beginning readers taught by sight-word methods, are highly constrained by the set of words previously taught. Since sight-word methods may permit minimal attention to graphic detail, such methods may inhibit development of word recognition strategies which transfer to reading of words not previously taught.

Transfer to identification of new words, it has been argued, is facilitated when the reader attends to all of the graphic information within words. The beginning reader's attention to internal graphic detail apparently is enhanced either by training on words very similar in appearance, or by training on letter-sound correspondences. Phonics methods attempt to provide students with knowledge of letter-sound correspondences. Children taught by phonics methods appear to display greater attention to graphic detail than children taught by sight-word methods. Erroneous oral responses to printed words of children taught by phonics methods often share more than one letter with the stimulus word. In addition, these responses are frequently non-words, and are not severely constrained by a set of

words presented during instruction. Because phonics methods appear to foster increased attention to graphic detail, and thereby promote development of word recognition transfer strategies, the use of such methods for initial reading instruction has been advocated by several researchers. Evidence has been discussed, however, which suggests that instruction by phonics methods may not result in adequate transfer strategies for all beginning readers. More able and less able beginning readers may be distinguished more by use of sound-symbol information for attending to graphic detail, than by knowledge of sound-symbol correspondences alone.

The literature reviewed in this section has been concerned primarily with development of beginning readers' attention to graphic detail in connection with reading of isolated words. In the case of isolated word presentation, only graphic information is available for the child's use. The ultimate objective of all reading instruction, however, is effective reading of connected discourse. For reading of contextual material, the child must coordinate his developing knowledge of graphic information with language information.

Beginning Readers' Use of Graphic and Contextual Information in Reading Connected Discourse

Ehri believed that words must be encountered in meaningful contexts in order for complete linquistic identities to be aroused. Once a child can recognize a few words from

their graphic forms, he can begin to read contextual material. He can use syntactic and semantic information from the familiar words to identify unknown words as he derives meaning. In this manner, the child may be able to expand his repertoire of familiar printed words.[23] Gibson and Levin also maintained that reading of contextual material, from the onset of instruction, permits parallel processing of all informational features of words.[24]

Successful reading of connected discourse requires that the beginning reader amalgamate his developing knowledge of graphic information with previously acquired syntactic and semantic information. In the opinion of some authors, it is reading of contextual material which makes graphic information useful and meaningful to the reader. According to Goodman, initial reading instruction may direct the child's attention to graphic detail, but contextual reading promotes development of strategies for using graphic information as an aid in comprehending.[25] Smith described the advantages gained by the beginning reader who reads increasing amounts of meaningful material:

> ...building vocabulary, making sense of letter-sound relationships, developing mediated meaning and word identification ability, acquiring speed, avoiding tunnel vision, preventing memory overload, relying on

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[23] Ehri, pp. 1-33.

[24] Gibson and Levin, p. 285.

[25] Kenneth Goodman, "Behind the Eye: What Happens in Reading," in Theoretical Models and Processes of Reading, ed. Harry Singer and Robert B. Ruddell (Newark: International Reading Association, 1976), pp. 470-496.

> sense; in short, increasing relevant non-visual information and using it more efficiently, the key aspects of reading that cannot be taught.[26]

Several investigators have examined oral reading errors made by beginning readers during reading of connected discourse. In each of these studies, qualitative analysis of errors was performed in order to infer children's strategies for coordinating graphic and contextual information. The nature of the studies appears to permit comparison of their results along at least two dimensions: the influence of instruction and differences in reading behavior exhibited by more able and less able readers.

Clay studied oral reading errors made by one hundred Scottish children during the first year of reading instruction. The focus of the research was on development of self-correction behavior by the five-year-old readers. Oral reading samples were taken once each week during the first year of instruction. All subjects followed a published reading scheme with a standard set of reading books. The teaching method emphasized instruction in response to errors made during the course of reading, rather than prior teaching of letter-sound relationships or words in isolation. A test of reading progress administered near the end of the study divided the total group into four quartile groups: high, high-middle, low-middle, and low.

During a weekly session with the investigator, it was customary for a child to read a short book of approximately

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[26]Smith, p. 181.

twelve pages or a story unit of about four to six pages from a larger book. Reading materials were those used for classroom instruction. Every response was categorized as true report, error, repetition, or self-correction. Motor responses concerning directional and spatial qualities of the text, such as finger-pointing and stressed vocal juncture, were also recorded.

Findings related to the preparatory stage, before children began reading the basic series, were primarily descriptive. Clay characterized error correction in the preparatory stage as locating behavior, as children attempted to find some print to match their oral responses. This locating behavior passed through several phases: from 1) page matching, in which children repeated a memorized text for the page without locating any detail in the print; to 2) line matching in which children repeated a memorized line of print, locating the line as a whole; to 3) locating some words within a memorized line; to 4) reading the spaces and thus coordinating visually located word patterns with speech impulses, and the spaces between words with vocal juncture; which led to 5) movement-speech mismatch when there were too few or too many spoken impulses for the number of patterns available, or speech-vision mismatch when a spoken word failed to coincide with its known visual pattern during the coordinating process. Clay observed that each higher group spent less time in the preparatory stage than each lower group: high, sixteen weeks; high-

middle, twenty-one weeks; low-middle, thirty-one weeks; low, thirty-six weeks.

Several findings were reported which concerned self-correction in the book reading stage. There were large differences among progress groups in the amount of reading during the first year at school, each higher group differing significantly from each lower group ($p<.01$). Rates at which children made errors were significantly different for all progress groups ($p<.01$). The median child in the high group made one error in every 37.39 words read, compared with the median child in the low group who made one error in every 2.58 words. High and high-middle groups corrected one in every three to four errors and were significantly different in this behavior from low-middle and low groups where self-correction rates were one in eight errors and one in twenty errors respectively. Clay found also that beginning readers substituted syntactically appropriate words in seventy-two percent of all substitution errors. Only forty-three percent of such errors, however, showed some aspect of graphic similarity to text words.

Clay suggested that the child who coordinates cues from graphic and language sources, and who has an awareness that identity consists of agreement in all details, has developed a way of learning from his errors. As he searches and checks, more and more graphic detail attracts his attention, and he may become sensitized to important interrelationships in language which provide cues and checks.

The high group readers made many errors which provided the opportunity to develop search and check procedures. The errors of the high group, however, were surrounded by many correct responses, which provided strong contextual background to errors when they occurred. The high group readers therefore became progressively better at self-correction. Low group readers, in contrast, made errors with such frequency that use of contextual information for self-correction was impeded. Low group readers, then, were not afforded equal opportunity for developing search and check procedures, and for developing awareness of graphic relationships.[27]

Weber analyzed the oral reading errors of twenty-one first graders taught by a sight-word method. Subjects were placed by the teacher into four groups, based on ability to proceed through pre-reading instruction. For the study, the investigator compared high achievers (twelve children in the two faster moving groups) with low achievers (nine children in the two slower moving groups). By May of first grade, all subjects in the high group could identify words which had never been taught; most children in the low group could not read new words. Mean scores on the Word Knowledge and Word Discrimination subtests of the Metropolitan Achievement Test were 2.6 and 2.9 for the high group, and 1.8 and 1.8 for the low group. All but one child in the

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[27] Marie M. Clay, "Reading Errors and Self-Correction Behavior," British Journal of Educational Psychology, XXXIX (1969): 47-56.

high group scored above grade level on the comprehension subtest (mean, 2.8; n=11); all children tested in the low group scored at grade level or below (mean, 1.6; n=8).

Oral reading errors were recorded as children read aloud from their reading text books. The high group exhibited an error rate of 3.9 errors per one hundred words of text. The error rate for the low group was 6.7 errors per one hundred words. Thus, the high group read much more material than the low group while producing a comparable number of errors. A graphic similarilty index was developed to describe the degree to which substitution errors approximated correct responses in terms of letters. The text word was compared with the error response with regard to the number of letters the words shared, the position of shared letters, the position of shared letters relative to each other, the average length of the words, and the difference in length between the text word and the response word. The graphic similarity index was calculated for only those substitution errors which shared letters with text words, so that errors with no shared letters had a graphic similarity score of zero. Almost a fifth of the substitutions fell into this category. The proportion for the high group was fifteen percent, and for the low group, twenty-one percent. The graphic similarity scores indicated that in terms of letters the better readers approached correct responses more closely than did the slower readers. The mean graphic similarity scores were for the high group,

407.87, and for the low group, 269.47. Further analysis of graphic similarity indicated that the initial letter of a word was the most salient response cue for subjects in this study. In addition, substitution responses were highly constrained by the set of words which had been taught.

When errors were judged for grammatical acceptability, ninety-one percent of all errors were grammatically appropriate to the preceding sentence context. Differences in group behavior were negligible. Similar findings were reported for judgments of semantic acceptability. The high group, however, corrected errors which did not conform to sentence structure far more frequently than they did acceptable errors. The low group showed no corresponding difference in their correction behavior. The high group disregarded over seventy-three percent of grammatically acceptable errors, but ignored only fifteen percent of ungrammatical errors. The low group, on the other hand, ignored over sixty-eight percent of grammatically acceptable errors, but also failed to correct fifty-eight percent of ungrammatical errors.

The mean graphic similarity score for substitution errors which were not grammatically acceptable was 507.02, while for the substitution errors which were contextually acceptable the mean score was 333.24. Weber inferred from these results that when readers ignored contextual constraints, they were attending to graphic detail. Weber concluded that the beginning readers in this study exper-

ienced difficulty in coordinating information from both graphic and contextual sources.[28]

Subjects in Biemiller's study also were taught by a sight-word method. Two classrooms of first grade children were included in this study. One class consisted of twenty-four children from a middle-class suburban school. Three-fourths of the children in this class were above-average readers by the end of first grade, according to results of the Metropolitan Achievement Test. The second class consisted of twenty children from a lower-class rural school. Only two of seventeen children tested in this class attained grade level performance by the end of first grade. Oral reading samples were collected from October to May as children read aloud from basal readers used for instruction.

Biemiller found, as Weber[29] had reported, that response errors came predominantly from the set of words which had been taught. From an analysis of errors, the investigator developed a three-phase model of reading acquisition. The initial phase was characterized by a large proportion of contextually constrained errors. The second phase, the no-response phase, was defined when at least fifty percent of a child's errors were errors of no-response. A no-response error was recorded when a child

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[28] Rose-Marie Weber, "A Linguistic Analysis of First Grade Errors," Reading Research Quarterly, V (1970): 428-451.

[29] Ibid.

stopped reading just before a word it was assumed he did not know. The third phase was characterized by a decrease in no-response errors to below fifty percent of all errors, and an increase in proportion of errors which were both graphically and contextually constrained. In October, sixteen children were in the no-response phase. During the year, most children shifted through the no-response phase and then into phase three. No child who finished the year in phase three had skipped the no-response phase.

Children in the no-response phase differed from their performance in phase one in that they made significantly fewer contextually constrained substitutions and more graphic substitutions. (Graphic similarity was determined on the basis of shared initial letter of text words and errors.) In both phases, however, about one-third of graphically similar substitutions were also contextually constrained. The direction of change, then, for the total group in the no-response phase was away from use of contextual constraints and toward increased use of graphic information. In phase three, following the no-reponse phase, the total group showed an increase in proportion of substitutions which were both graphically and contextually constrained.

The aforementioned results tend to mask differences among ability groups in this study. Biemiller further analyzed contextual and graphic constraint on substitution errors by high, average, and low groups in the three

phases. The percentages of contextually acceptable substitutions for the high group in the three phases were eighty-six percent, eighty-percent, and eighty-four percent. For the average group, percentages were sixty-two percent, seventy-two percent, and eighty-one percent. Corresponding percentages for the low group were seventy-eight percent, seventy-seven percent and eighty-one percent. The high group alone showed a substantial decrease in contextually constrained substitution in phase two, the no-response phase. The average group displayed an increase in use of contextual constraint in the no-response phase; while the low group showed no appreciable change. With respect to graphic similarity of substitutions and text words, further analysis did indicate an appreciable increase in use of graphic constraint by high and middle groups in the no-response phase. No such shift, however, was apparent for the low group. Percentages of graphic substitutions for the low group in the three phases were twenty-percent, twenty-three percent, and twenty-six percent. Biemiller suggested that the transition to the no-response phase marks the beginning of the child's attempt to utilize graphic detail. As the child enters phase three, he is beginning to successfully integrate graphic and contextual information.[30] While these trends may be accurate for the more able readers in Biemiller's study, they do not accur-

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[30] A. J. Biemiller, "The Development of the Use of Graphic and Contextual Information as Children Learn to Read," Reading Research Quarterly, VI (1970): 75-96.

ately depict the progress of less able readers. The low group readers in this study maintained reliance on contextual constraints throughout first grade, while only gradually and slightly increasing use of graphic information.

Biemiller observed that, in general, the earlier a child moved into the no-response phase, the better was his reading performance at the end of first grade. As a result, the investigator recommended that initial reading instruction focus on training in situations which require no context, in order to compel the child to use graphic information as much as possible. As the child shows evidence of accurate reading out of context, he can be given contextual material to read.[31] Many phonics methods, in fact, do initially emphasize attention to graphic detail out of context.

Cohen examined oral reading errors of first grade children taught by a phonics method. Subjects were fifty children from two heterogeneously grouped classes in a suburban, middle-class elementary school. All subjects received instruction in letter-sound associations and blending. The instructional sequence progressed from sounds to words to sentences. Errors were recorded monthly for each child as he read orally from two different contextual materials. Subjects read one selection from class instructional material, and one selection from tradebook materials. Subjects were ranked according to the number of

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[31] Ibid.

correct words read each month on both presentations. Those subjects whose monthly number of correct words consistently fell within the first quartile were designated good readers. Poor readers were those subjects whose monthly number of correct words consistently fell within the last quartile.

Distribution of no-response, nonsense, and word substitution errors was different for good and poor readers. Although both groups made more no-response errors than any other kind during the first half of the study, for good readers, no-response predominated only on the instructional presentation. No response exceeded word substitution for the good readers by a narrow margin on the instructional presentation. Poor readers, in contrast, made a greater proportion of no-response errors, regardless of presentation. On non-instructional material, good readers made more nonsense errors than any other type. For poor readers, during the first half of the study, story errors (responses which bore little graphic or contextual resemblance to the text) and letter-naming responses ranked second to no-response errors on non-instructional material. From March to June, no-response errors dropped to last place for good readers, but for poor readers it remained as the single largest source of error.

Good readers' no-response errors declined sharply and rapidly, so that by the end of the study few of these errors remained. Poor readers, however, showed only a gradu-

al and moderate decrease in no-response errors. Nonsense errors made by good readers increased sharply, particularly on non-instructional material, but then diminished. For poor readers, nonsense errors were rare initially and then gradually increased. At no time, however, did poor readers attain the proportions of nonsense errors produced by good readers during the second and third months. Furthermore, for good readers, nonsense production varied with presentation; this was not the case for poor readers.

Word substitution errors increased for both groups throughout the study. From the beginning, however, good readers made proportionately more substitutions. Self-correction increased substantially for good readers, but only slightly for poor readers.

Both nonsense and word substitution errors were assessed for graphic similarity to text words. Good readers made almost no non-systematic errors (responses which shared no letters in common with text words). In contrast, these were initially high for poor readers and declined later. Errors which shared only first and/or last letters with text words were initially low for good readers and diminished in time. For poor readers, such errors remained high throughout the study. Errors which shared at least half of the letters of text words increased for both groups, but were always higher for good readers.

Starting with December, a high proportion of good readers' word substitutions were grammatically acceptable

on instructional material. Grammaticality for non-instructional material improved as sensible context increased. By June, nearly three-fourths of all substitutions made by good readers were grammatical on both presentations. Poor readers produced insufficient real word context until the second half of the study. Of these real word substitutions, acceptable and non-acceptable errors were approximately equal.

Cohen agreed with Biemiller's[32] interpretation that a predominance of no-response errors reflects the child's attempts to utilize graphic detail. Instructional method, however, influences the point at which no-response appears in the developmental sequence. Subjects in the Cohen study received initial training which emphasized systematic use of letter-sound relationships. Since the ability to use these relationships was not well developed, the error that first predominated was no-response. For poor readers, story errors and letter-naming responses also characterized early reading efforts. Such errors, according to Cohen, appear to reflect a failure to integrate the particular with the whole. For some children, like the poor readers in this study, training in letter-sound blending may not be sufficient to accomplish the understanding of what reading is.

Nonsense errors, according to Cohen, appear to represent the ability to explore words while still not having

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[32] Ibid.

accurate knowledge or recall of all letter-sounds. The investigator noted that substantial differences between good and poor readers in nonsense production already existed at the beginning of the study. Good readers produced the highest proportion of nonsense errors early in instruction. Poor readers never attained a comparably high level of nonsense errors.[33] If Cohen's interpretation of nonsense errors is plausible, poor readers in this study did not systematically explore or scan words for graphic relationships as did good readers.

Word substitution increased throughout the Cohen study, but more dramatically for good readers. As the proportion of correct words increased, more context was available to stimulate word substitutions. Cohen suggested that word substitutions may result from an inaccurate first sampling. Self-corrections may occur when the reader reconsiders his first response in view of other information. Cohen believed that increase in self-correction reflects a growing ability to selectively sample letter arrangements. More self-corrections are made by good readers, according to Cohen, because good readers are more capable of successive explorations of a word rather than remaining with a first decision. Cohen further suggested that good readers' ability to scan words for letter arrangements was supported by the analysis of graphic approximation of errors to text words. Graphic approximation was always higher for good

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[33] Cohen, pp. 616-650.

readers.[34]

Summary

It has been suggested that contextual reading, for beginning readers, fosters development of complete linguistic identities for an increasing number of words. While reading in context, the child can draw upon his knowledge of language as he attends to and integrates information from graphic symbols. In short, context provides the setting in which the beginner learns to coordinate information from various sources so that reading becomes a meaningful process.

Such a view of the significance of contextual reading, however, appears to be only partially accurate. Studies of oral reading errors made by first graders while reading connected discourse suggest that important differences in the contextual reading strategies of more able and less able readers can be clearly identified. Furthermore, such differences are discernable across instructional methods.

The influence of instructional method on contextual reading strategies appeared primarily in the timing or sequence in which certain reading behavior occurred. For children taught by sight-word methods, a no-response phase (considered to mark the onset of increased attention to graphic detail) was preceded by an initial phase in which

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[34] Ibid.

most errors were contextually constrained. For children taught by phonics methods, however, the initial phase was typified by errors of no-response. Contextual constraint, for these children, played a less important role until real word production increased. Certain behaviors did appear to be characteristic of a particular method. For example, substitution errors of children taught by sight-word methods were highly constrained by the set of words presented during instruction. Such constraint was not evident in responses of children taught by phonics methods. Children taught by phonics methods, on the other hand, produced many nonsense errors. Nonsense errors were uncharacteristic for children taught by sight-word methods.

Regardless of instructional method, more able and less able beginning readers exhibited differences in reading strategies during first grade. Better readers, for example, showed a marked increase in attention to graphic detail throughout the first year of instruction. This was exemplified in two ways: through an increasing proportion of correct responses, and through increasing graphic similarity of error responses to text words. Less able readers, in contrast, displayed only slight increase in attention to graphic detail.

More able readers at the end of first grade were beginning to successfully integrate graphic and contextual information. This was evident in the increased proportions of errors which were both contextually constrained

and graphically similar to text words. Responses of less able readers, however, reflected continued dependence upon either graphic or contextual information, but not both.

Finally, more able readers were beginning to successfully monitor their responses for meaningfulness. This behavior was apparent in the increased proportions of errors which were self-corrected. Less able readers showed no corresponding increase in self-correction behavior. It must be noted that none of the studies reviewed in this section attempted to assess students' comprehension of material which was read orally.

While development of important reading strategies may depend upon reading connected discourse, contextual reading does not appear to foster such development equally for all beginning readers. Less able beginning readers do not appear to benefit, to the degree that more able readers benefit, from typical contextual reading practice. Repeated reading of contextual material may provide an alternate means of contextual reading practice for less able readers.

Repeated Reading as It Affects Attention to Graphic Detail and Reading of Connected Discourse

A number of studies have examined the effect of contextual conditions on beginning readers' word recognition abilities. Singer, Samuels, and Spiroff investigated the effects of four presentation conditions on children's learning of responses to printed words. Words to be learned were printed in an artificial alphabet. The four presenta-

tion conditions were: 1) word with picture; 2) word alone, no picture; 3) word in sentence context with picture; and 4) word in sentence context, no picture. Subjects were eighty first grade children and eighty-four second grade children from a metropolitan school system. For testing, the four words used in training were printed on individual cards in artificial alphabet. Study and test trials were alternated for a maximum of twelve trials. Criterion was designated as four correct responses on two successive trials. The pattern of responses was similar for both grade levels studied. The subjects trained in the word with no picture condition had fewest trials to criterion and significantly more correct responses than subjects in other conditions. The authors concluded that visual attention must be focused on the printed words to facilitate acquisition of word recognition responses. The authors noted also that many subjects reached criterion under each treatment condition, but that the addition of pictures or context reduced learning efficiency.[35]

Pearson and Studt hypothesized that different types of context may exert differential effects on word identification abilities. Subjects for this study were thirty-six first graders and thirty-six third graders. Target words were twelve synonym-pairs. Within each pair, each word

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[35] Harry Singer, S. Jay Samuels, and Jean Spiroff, "The Effect of Pictures and Contextual Conditions on Learning Responses to Printed Words," Reading Research Quarterly, IX (1973-1974): 555-567.

contained four or more letters; both words contained the same number of letters; and one member was a high-frequency word while the second member was a low-frequency word. Three levels of sentence context were developed for each pair of target words: rich context, moderate context, and poor context. Each subject was to guess what word fit in the blanks and a space was left for each letter in the missing word. If the subject's initial guess was wrong, the experimenter wrote in the first letter of the target word and the subject would guess again. Another wrong guess prompted the next letter of the target word. This procedure continued until the word was correctly identified or all the letters were filled in. Third grade subjects read the sentences aloud, while, for the first grade subjects, the experimenter read the sentences aloud.

The mean proportion of a word required for its identification by third graders (65.19%) was significantly less ($p<.01$) than that needed by first graders (72.75%). The mean proportion needed for identification of high-frequency words (51.38%) was significantly less ($p<.001$) than that needed for low-frequency words (86.56%). A significant interaction between word frequency and grade ($p<.025$) indicated that the differences between third and first graders were more pronounced for high-frequency than low-frequency words. Context had a significant effect ($p<.01$) on proportion of a word needed for identification. Levels ranked from rich context (49.13%), to moderate context (68.51%),

to poor context (39.27%). The authors concluded that when a word is clearly within a child's oral language repertoire, he is able to use contextual constraints with a minimal amount of visual information for word identification. When a word is less familiar to the child, however, nearly the entire word is required for its identification, even when the context is highly definitive.[36]

Fleisher and Jenkins compared the effectiveness of reading in context alone (contextualized practice) and reading in context supplemented with isolated word practice (decontextualized practice). Reading performance was assessed both on isolated words and in connected discourse. Six first grade learning disabled boys served as subjects in a repeated measures design. Materials used were the Sullivan Associates Programmed Reading Series. All students began each tutoring session with two minutes of practice on isolated letter-sound relationships, concentrating on those sounds introduced in the books they were reading. Students in the contextualized practice condition then read orally to the tutor for twenty-five minutes. When a child could not identify a word, he was instructed to sound it out. If the child still could not identify the word, sounding out procedures were modeled by the tutor and repeated by the child. Reading during the next session began

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[36] P. David Pearson and Alice Studt, "Effects of Word Frequency and Contextual Richness on Children's Word Identification Abilities," Journal of Educational Psychology, LXVII (1975): 89-95.

on material immediately following previously completed pages. Subjects in the decontextualized practice condition also spent the next twenty-five minutes with the tutor. The first portion of the lesson, seven minutes, was devoted to practice with isolated words. For the next eighteen minutes, subjects read orally to the tutor. Sounding out and modeling procedures were the same as those for contextualized practice.

Results indicated that decontextualized practice was more effective than contextualized practice for recognition of isolated words ($p<.001$). Neither practice condition, however, was more effective for reading rate in context, error rate in context, and percent of words read correctly in context. The authors observed that contextualized practice, although less efficient than decontextualized practice, did improve subjects' recognition of isolated words. Fleisher and Jenkins concluded that a single reading of context material was not itself sufficient to produce high levels of accuracy on isolated word recognition. According to the investigators, a more concentrated training procedure which would involve more than a single reading of context material may be needed.[37]

Gonzales and Elijah examined the reading performance

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[37] Lisa Sperling Fleisher and Joseph R. Jenkins, "Effects of Contextualized and Decontextualized Practice Conditions on Word Recognition," Technical Report Number 54 (Bolt, Beranek, and Newman, Inc., Cambridge, Massachusetts; Illinois University, Urbana), Center for the Study of Reading (1977).

of third grade subjects on two repeated oral readings of passages at both instructional and frustration levels. Twenty-six third grade students from a middle-class urban elementary school were selected as subjects. These students were reading not more than three-fourths of a year above or below a 3.5 reading level. Instructional level was defined as the level at which word recognition accuracy did not exceed ninety-one to ninety-four percent. Frustration level was the level at which word recognition accuracy fell below ninety-one percent. The Standard Reading Inventory was administered to each subject to establish instructional and frustration levels. Extended oral passages of approximately one hundred seventy-five words were administered to each subject within two days of the initial screening. Each subject was asked to orally read and then immediately reread the extended oral passage at his instructional level. The same procedure was followed with the frustration level passage. Results indicated that the pattern of errors for each subject on all four readings was very similar. However, the reduction in errors from the first to the second reading at instructional level was sufficient to reclassify the previously obtained instructional level as independent level (from 93.5% to 94.7% accuracy). Also, rereading of frustration level material increased word recognition accuracy, so that the obtained frustration level could be reclassified as instructional level (from 88.89% to 92.4% accuracy). The investigators

concluded that with two repeated readings of context material, an important reduction in word recognition errors can be detected.[38]

A few investigations have examined in greater detail the effects of repeated reading practice. Samuels described the results of a study in which the repeated reading method was used with mentally retarded students. These children, who had been experiencing difficulty in learning to read, were asked to select easy stories which were of interest to them. From these stories, selections of fifty to two hundred words were marked off for practice. Each student read his selection to the investigator, who recorded the reading speed and number of word recognition errors. The student then practiced the selection at his desk, while another student read to the investigator. When the first student was called upon to read again, the procedure was repeated until an eighty-five word per minute criterion rate was reached. Then the student moved on to the next passage.

Results were reported for one student on reading speed and word recognition accuracy for five separate passages. As reading speed increased, word recognition errors decreased. As the student continued to use repeated reading, the initial speed of reading each new selection was faster than initial speed on the previous selection. Also,

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[38] Philip G. Gonzales and David V. Elijah, "Rereading: Effect on Error Patterns and Performance Levels on the IRI," The Reading Teacher, XXVIII (1975): 647-652.

the number of readings required to reach the criterion rate decreased with each new selection. The investigator reported that progress for other students in the group was quite similar to that of the individual for whom results were detailed. Samuels believed that the results indicated transfer of training and general improvement in reading fluency.[39]

Dahl tested the repeated reading method, as well as the hypothesis/test method and the flashed word method. Interactions among the methods were also examined. Subjects were the thirty-two poorest readers in the second grade of a middle-class suburban elementary school. Subjects were randomly assigned to one of eight groups in a two by two by two factorial design.

Subjects in the hypothesis/test condition were to be trained on seven component skills derived from a model of word recognition. Instruction included: 1) training on the ability to say a word given an initial sound; 2) training on the ability to determine the beginning letter of a spoken word; 3) training on the ability to visually recognize the initial letter of a word presented orally; 4) training on the ability to use auditory context to predict words that could logically follow; 5) training on the ability to use auditory context to predict word(s) that could logically follow in a sentence hearing just the initial sound of

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[39] S. Jay Samuels, "The Method of Repeated Readings," The Reading Teacher, XXXII (1979): 403-408.

the word; 6) training on the ability to use visual context to predict word(s) that could logically follow in a sentence without seeing the initial letter of the word; and 7) training on the ability to use visual context to predict word(s) that could logically follow in a sentence when given the initial letter of the target word. An informal inventory administered at the beginning of the study revealed that further training on components one through four was unnecessary. Therefore, instruction was actually restricted to component skills five through seven.

Subjects in the flashed word condition received training on eight hundred isolated words selected from the Macmillan Basic Reading Series and the Dale List of 3000 Familiar Words. Words were flashed with a carousel projector at progressively faster rates of exposure.

In the repeated reading condition, each subject read orally a one hundred word passage typed on an index card. Reading rate and number of word recognition errors were recorded on a graph. The subject then reread the passage at his desk and recorded the number of rereadings on a personal chart until called on by the investigator to read orally again. This sequence continued until the criterion rate of one hundred words per minute was reached. Then the student began a new passage. The level of difficulty of the passages was individually controlled for each student. An initial reading rate on a passage of thirty-five to fifty words per minute was considered an acceptable level

of difficulty. The passages were selected from supplementary readers, library reference books, and high school and college textbooks. Initially, all subjects were given a passage at the third grade level. By the end of the study, subjects were reading selections ranging from fourth grade level to thirteenth grade level.

Subjects in all eight groups received equivalent amounts of daily instruction. Basal readers were used in all groups for basic reading instruction. Twenty minutes daily training was given for each experimental factor. During experimental training, control subjects received additional basic reading instruction.

Reading performance was assessed on five measures at the conclusion of the eight-month study. A cloze test and a modified cloze test were administered with passages at the third grade reading level. For both tests, deletions were not based on any prescribed nth word system but rather were chosen by the investigator on the basis of adequate context clues. On the modified cloze test, the letter or letters representing the initial sound was provided as an additional cue. For both tests, each subject read orally to the investigator. Only exact answers were scored as correct. A one hundred word passage at the third grade level was administered as a timed oral reading test. Reading time and number of word recognition errors were recorded. Also administered was the Gates-MacGinitie Reading Test, Primary CS, Speed and Accuracy for Grades Two and

Three. Finally, a flashed word recognition test was administered. Eighty words were selected, forty from the eight hundred practiced by subjects in the flashed word condition, and forty from a pool of words not yet practiced.

Three-way analysis of variance was used for data analysis. On the cloze test, significant ($p<.01$) main effects were reported for hypothesis/test and repeated readings. There was also a significant ($p<.05$) two-way interaction for hypothesis/test and repeated readings. Significant main effects on the modified cloze test were reported for hypothesis/test ($p<.01$) and flashed words ($p<.05$). The repeated reading factor approached significance on the modified cloze test. Only the hypothesis/test factor had a significant ($p<.01$) effect on the Gates-MacGinitie results. For the timed oral reading test (number of word recognition errors), only repeated reading had a significant ($p<.05$) main effect. For the timed oral reading test (reading time), significant effects were reported for hypothesis/test ($p<.05$), repeated reading ($p<.01$), and the interaction of these two factors ($p<.01$). On the flashed word recognition test (words used in training), hypothesis/test and repeated readings had significant ($p<.01$) main effects. There was a significant ($p<.05$) two-way interaction for hypothesis/test and flashed words. For the flashed word recognition test (new words), significant ($p<.05$) main effects were reported for hypothesis/test and repeated reading. Dahl concluded that both hypothesis/test

training and repeated reading training appear to enhance students' ability to read with speed and comprehension. Furthermore, according to the investigator, repeated reading appears to provide the practice necessary for early development of fluent reading. Using repeated practice in meaningful context gives the child the opportunity to integrate component subskills.[40]

Other investigations have found that training with sentence context[41] or with a single reading of contextual material[42] has less effect on isolated word recognition than training on the words themselves. Dahl's[43] findings indicated that subjects who received repeated reading training (with no training on isolated words) performed better on a test of isolated word recognition than did subjects who were trained on the words included in the test.

Miller investigated the effects of a version of repeated reading, referred to as assisted reading. The investigator hoped to determine whether high school students with a history of reading problems would demonstrate more effective use of graphophonic, syntactic, and semantic cue systems in the reading process after treatment with assist-

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[40] Patricia J. R. Dahl, "An Experimental Program for Teaching High Speed Word Recognition and Comprehension Skills," Final Report (Bloomington Public Schools, Minnesota), National Institute of Education, Washington, D.C. (1974).

[41] Singer, Samuels, and Spiroff, pp. 555-567.

[42] Fleisher and Jenkins, p. 39.

[43] Dahl, pp. 78-79.

ed reading. Subjects were seven male students from a small rural high school. Subjects were assigned to the research group on the basis of need as indicated by previous achievement test scores and a history of reading problems. Three subjects were in eighth grade (two in regular classrooms, and one in a classroom for the educable mentally retarded). Two subjects were in regular ninth grade classes, and two were in regular twelfth grade classes. Materials used for assisted reading included paperback novels and a civics textbook. Reading materials were tape-recorded by the investigator.

Subjects proceeded through three stages of assisted reading. Stage one was characterized by repeating of phrases or sentences one at a time during a pause in the tape. In stage two, subjects read along with the tape-recording without pauses. Stage three was characterized by independent reading without the tape-recording. The criterion for advancement from one stage to another was judgment by the investigator that the subject could recognize most of the words in the selection. In each stage, when the subject felt that he could recognize most of the words in his selection, he was asked to retell what he had read to the investigator. Subsequent to the retelling, the subject read the selection orally to the investigator.

Each subject read orally a story from the Reading Miscue Inventory Readings for Taping before initial and after final assisted reading sessions. Errors were re-

corded and analyzed following Reading Miscue Inventory procedures. Error patterns from pre-tests and post-tests were compared.

Results indicated that the total group produced more structures which were totally acceptable semantically on the post-test. This was evidenced by an increase in number of errors which resulted in no loss of meaning. The total group produced more structures which were both syntactically and semantically acceptable with respect to total context. This was supported by an increase in number of errors which shared grammatical functions with text words, and were syntactically acceptable up to and beyond the occurrence of the error. Retelling scores, based on points assigned for information recalled from the story, improved for all subjects from pre-test to post-test. The investigator reported that subjects' use of graphophonic cues did not change appreciably from pre-test to post-test. Miller concluded that treatment with assisted reading resulted in improved integration of graphic and contextual information in the reading process.[44]

Hoskisson, Sherman, and Smith used assisted reading in a four-month study with two second grade subjects. The two children were selected from a regular second grade classroom in a middle-class, rural school. Subjects were

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[44] Bonnie Lee Miller, "Assisted Reading as a Remedial Reading Technique at the High School Level: A Psycholinguistic Evaluation," (Ph.D. dissertation, Virginia Polytechnic and State University, 1977).

chosen because of low reading achievement scores on the Stanford Achievement Test, reluctance to cooperate during reading instruction, and because their parents agreed to cooperate. One child was nine years old; the other was seven years old. No control subjects were used for comparison in this study.

Investigators met with subjects' parents at the beginning of the study and instructed them concerning assisted reading procedures to be followed at home. During the study, subjects' homes were visited periodically by investigators to determine whether instructions were being carried out. Classroom reading instruction followed the Ginn 360 program.

Three times per week, one of the investigators held an individual thirty-minute session with each subject. During these sessions an assisted reading program was carried out. Also, during these sessions, reading rate was assessed and oral reading tests were administered.

Reading improvement was assessed by means of oral reading error analysis, reading rate improvement, and Stanford Achievement Test scores. Oral reading error analysis was conducted four times during the study.

For subject one, the nine year old, the majority of oral reading errors throughout the study were not disruptive to meaning. Self-correction improved throughout the study. On the final error analysis, most error responses were grammatically acceptable as well as graphically simi-

lar to text words. The percentage of errors decreased throughout the study. Reading rate gradually increased from thirty-six words per minute at the beginning of the investigation to forty-four words per minute at the conclusion of the study. Gains for the first subject on the Stanford Achievement Test were: word recognition, nine months; paragraph meaning, five months; and vocabulary, fourteen months.

For subject two, the seven year old, the majority of errors throughout the study resulted in minimal or no meaning change. Most errors were graphically similar to test words. The percentage of errors decreased throughout the study. Reading rate increased from twenty-eight to thirty-seven words per minute from the beginning to the end of the study. For the second subject, gains reported on the Stanford Achievement Test were: word recognition, seven months; paragraph meaning, five months; and vocabulary, one month.[45]

Hoskisson and Krohm conducted an informal investigation, using assisted reading as an adjunct to regular reading instruction in a second grade classroom. Assisted reading was instituted with the aid of tape-recorded stories. A listening-reading station was established in the classroom. The station contained a cassette recorder, a phonograph, six supplementary reading books with tape-

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[45] Kenneth Hoskisson, Thomas Sherman, and Linda F. Smith, "Assisted Reading and Parent Involvement," The Reading Teacher, XXVII (1974): 710-714.

recorded stories, and six headphones. In addition, pupils were paired with partners once per week for reading of stories which previously the students had been assisted to read. The listener provided his partner with any words not remembered.

Findings were reported in anecdotal form. It was observed that slower readers became more confident in their reading ability, since they were more eager to read and respond to questioning. Slow readers began attacking new words more often, with greater success. An increased interest in books and improvement in listening skills were reported for all students.[46]

Chomsky tested the text memorization technique, another version of repeated reading. Subjects were the five slowest readers in third grade at a middle-class suburban elementary school. The three boys and two girls were eight years old, of normal intelligence, and were all reading one to two years below grade level. On the Metropolitan Achievement Test administered in October of third grade, subjects' grade equivalent scores ranged from 1.7 to 2.2 on the Reading subtest, and from 1.2 to 2.6 on the Word Knowledge subtest. Prior to the study, subjects had received a great deal of phonics training and had acquired many phonics skills. All subjects met regularly with a remedial reading teacher, with whom they had worked intensively

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[46] Kenneth Hoskisson and Bernadette Krohm, "Reading by Immersion: Assisted Reading," Elementary English, LI (1974): 832-836.

since first grade. The investigator observed that the subjects could decode only laboriously. None of the subjects, according to Chomsky, had progressed to even the beginning of fluent reading. Furthermore, they appeared to dislike reading and avoided it whenever possible.

Materials used included five tape recorders and two dozen storybooks recorded on tape. The books ranged from second to fifth grade reading level. Most of the books were twenty to thirty pages each; a few were considerably longer. Subjects were instructed to select a book which was too difficult for independent reading, but not so hard as to be completely out of range. Four subjects initially chose from among the easier short stories; one girl selected a long, relatively difficult book. Subjects were told to listen to their tapes every day, using earphones, following along in the printed text. They were to listen to the whole book through at least once and then relisten to any part they cared to prepare more carefully. They could also record themselves reading along with the master tape or record themselves reading aloud independently. In addition to working at school, subjects took the tape recorders and several books home for approximately one month. Subjects also were provided with note books, with which they were encouraged to write about their stories.

Bi-weekly thirty-minute sessions were held by the investigator with each subject. During these sessions, the subject read orally as much of his book as he had pre-

pared. The investigator provided analytical phonics instruction with those passages which the subject could read fluently. This phonics instruction was discontinued during the third month of the study because, according to the investigator, subjects no longer required it.

Four children required approximately twenty listenings over a one month period to achieve fluency in reading the first book orally. One child achieved fluency with the first book within two weeks, and required approximately twelve listenings. Subsequent books required less and less time. By the time the children were on their fourth or fifth book, they were able to achieve fluency within one week. At the end of three months, all subjects had achieved fluency with six or more books. In addition, parents and teachers reported that all subjects increased their independent reading.

Pre- and post-test scores on several reading diagnostic tests at week one and week fifteen of the study were reported. On the Wide Range Achievement Test, Reading subtest, subjects averaged a gain of five months. Results of the Durrell Analysis of Reading Difficulty showed gains in oral reading speed of several months to one year. The Gates-McKillop subtest, Phrases: Flash Presentation, showed an average gain of six months. On the Metropolitan Achievement Test administered in October of fourth grade, five months after the end of the study, subjects showed grade-score gains of .6 to 1.2 over their scores of a year earli-

er. The investigator noted that while these fourth grade scores were still well below grade level, they appear to indicate a substantial increase in rate of progress during third grade, as compared with grades one and two.

Chomsky concluded that the text memorization technique provided children in this study with necessary practice in reading connected discourse, and put the children in touch with a variety of books. During the four month study, according to the investigator, subjects' passivity about reading declined dramatically, confidence in reading ability increased, and children began to increase independent reading.[47]

Summary

Evidence supports the belief that beginning readers can use contextual information for word identification, if the context is sufficiently specific and the words to be identified are within the children's oral language background. Reading of sentence context appears to facilitate recognition of isolated words for beginning readers, although not as efficiently as practice with the words themselves. Also, a single reading of contextual story material appears to promote recognition of isolated words from that material, although less efficiently than when contextual practice is accompanied by isolated word practice.

Rereading of contextual material, however, apparently

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[47] Carol Chomsky, "After Decoding: What?" Language Arts, LIII (1976): 288-296, 314.

promotes recognition of words presented in isolation, even when no specific training on those words is provided. Repeated reading also seems to promote reduction in number of contextual word recognition errors. In short, repeated reading appears to foster increased attention to graphic information.

Repeated reading, moreover, appears to enhance improved integration of graphic and contextual information in reading. Subjects in various studies which employed repeated reading improved reading rates while simultaneously decreasing error responses. Error analysis in several studies indicated increased proportions of contextually acceptable errors which were also graphically similar to text words. Improvement in self-correction behavior also was observed by several researchers. Finally, repeated reading practice was observed to result in improved comprehension.

Discussion of Related Literature

The beginning reader must learn to attend to graphic detail in order to distinguish one word from another, and also to develop procedures for identifying new words. Beginning readers taught by sight-word methods are likely to develop procedures for word recognition which depend upon minimal inspection of intra-word detail.[48] Phonics methods, on the other hand, promote greater attention to graph-

[48] Barr, "Word Recognition Errors," pp. 509-529; and Barr, "Pupil Reading Strategies," pp. 555-582.

ic detail for word recognition.[49] Recognition of the graphic form of a word is important for the beginning reader, since it triggers association of other linguistic identities for the word which have been previously acquired.[50] Meaningful reading, then, depends upon the formation of complete linguistic identities for an increasing number of words. Linguistic identities for many words, however, may vary according to the manner in which the words are used in context. Therefore, development of word recognition procedures may require a variety of contextual reading practice.

In reading of connected discourse, the beginning reader is confronted not only with the necessity of attending to graphic detail for word recognition, but also with the task of coordinating graphic information with contextual information for deriving meaning. In this situation, the beginning reader must apply his developing knowledge of graphic information in order to recognize the words. It is in the application of such knowledge that differences between more able and less able readers begin to emerge.[51] Less able readers produce error responses in oral reading

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[49] Barr, "Word Recognition Errors," pp. 509-529; Barr, "Pupil Reading Strategies," pp. 555-582; and Jeffrey and Samuels, pp. 354-358.

[50] Ehri, pp. 1-33.

[51] Guthrie, pp. 9-18; Cohen, pp. 616-650; and Chomsky, pp. 288-296, 314.

at a much greater rate than do better readers.[52] If a sufficient proportion of words are not correctly recognized, contextual information remains unavailable to the reader. The lack of access to contextual information for less able readers may impede further word recognition development,[53] as well as interfere with efforts to monitor responses for meaningfulness.[54] More able readers, in contrast, because they correctly recognize a sufficient number of words, are afforded greater access to contextual information. As a consequence of greater access to contextual information, more able readers can continually enlarge their word recognition repertoires and also learn to monitor their responses. Increased access to contextual information may further result in development of strategies for more effective use of graphic and contextual cues.[55] Skilled reading, according to some authors involves "hy-

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[52] Clay, pp. 47-56; and Weber, pp. 428-451.

[53] Ehri, pp. 1-33.

[54] Clay, pp. 47-56.

[55] Robert M. Schwartz, "Strategic Processes in Beginning Reading," Technical Report Number 15 (Bolt, Beranek, and Newman, Inc., Cambridge, Massachusetts; Illinois University, Urbana), Center for the Study of Reading (1976).

pothesis-testing"[56] or "prediction."[57] Such strategic reading behavior implies selection of appropriate cues from contextual and graphic information to eliminate unlikely alternatives in forthcoming text.

Studies of beginning readers' oral reading behavior suggest that reading strategy differences between more able and less able readers can be discerned during first grade.[58] These differences are apparent whether initial instruction emphasizes sight-word learning or phonics. Less able readers are less successful than their more able counterparts at attending to graphic detail within words. This difference is reflected both in the proportion of words correctly recognized and the graphic similarity of errors to text words. Better readers, by the end of first grade, are beginning to successfully integrate graphic and contextual information; whereas, less able readers are continuing to rely more exclusively on one or the other information source. This difference is reflected in the proportion of errors which are both contextually acceptable and graphically similar to text words. This difference is further reflected in the proportion of contextually unacceptable errors which are self-corrected.

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[56] E. B. Ryan and M. I. Semmel, "Reading as a Constructive Language Process," Reading Reserach Quarterly, V (1969): 59-83.

[57] Frank Smith, "The Role of Prediction in Reading," Elementary English, LII (1975): 305-311.

[58] Clay, pp. 47-56; Weber, pp. 428-451; Biemiller, pp. 75-96; and Cohen, pp. 616-650.

Studies concerned with the effects of repeated reading suggest the effectiveness of the method for increasing attention to graphic detail, and for improving integration of graphic and contextual information. Rereading of contextual material resulted in increased proportions of words correctly recognized,[59] as well as in increased graphic similarity of errors to text words.[60] Repeated reading also appeared to facilitate recognition of words presented in isolation.[61] Oral reading error analysis for children trained with repeated reading indicated increased proportions of errors which were both contextually and graphically constrained.[62] Repeated reading also resulted in increased self-correction of contextualy unacceptable errors.[63] Furthermore, repeated reading practice fostered improved reading speed and comprehension.[64]

Repeated reading appears to provide means whereby less able readers may overcome difficulties with graphic information processing, and gain increased access to contextual information. A search of the literature revealed

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[59] Samuels, "Repeated Readings," pp. 403-408; Gonzales and Elijah, pp. 647-652; and Hoskisson, Sherman, and Smith, pp. 710-714.

[60] Hoskisson, Sherman, and Smith, pp. 710-714.

[61] Dahl, pp. 78-79; and Chomsky, pp. 288-296, 314.

[62] Miller; and Hoskisson, Sherman, and Smith, pp. 710-714.

[63] Ibid.

[64] Dahl, p. 79; Miller; Hoskisson, Sherman, and Smith, pp. 710-714; and Chomsky, pp. 288-296, 314.

that repeated reading has not been employed with less able first grade readers. Singer, after reviewing research concerned with supplemental reading instruction, concluded that, "...the best intervention for low achieving students should come during the first grade and should supplement classroom instruction."[65] Repeated reading practice should permit less able beginning readers to develop reading strategies which approximate strategies exhibited by more able readers.

Hypotheses

On the basis of the preceding literature review, the following hypotheses were formulated:

1. Repeated reading practice will result in increased attention to graphic detail by first grade readers. Increased attention to graphic detail will be reflected in: a) sight vocabulary growth; b) decrease in number of oral reading errors in connected discourse; and c) increase in graphic similarity of oral reading errors to text words in connected discourse.

2. Repeated reading practice will result in increased integration of graphic and contextual information by first grade readers. Increased integration of graphic and contextual information will be reflected in: a) in-

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[65] Harry Singer, "Research in Reading that Should Make a Difference in Classroom Instruction," in What Research Has To Say About Reading Instruction, ed. S. Jay Samuels (Newark: International Reading Association, 1978), pp. 57-71.

crease in proportion of oral reading errors with both graphic similarity to text words and contextual acceptability; and b) increase in proportion of contextually unacceptable oral reading errors which are self-corrected.

3. Repeated reading practice will result in improved oral reading fluency for first grade readers.

CHAPTER III

METHOD

This study attempted to determine the effects on use of reading strategies by first grade readers, when regular reading instruction was supplemented by repeated reading practice. Specifically, this study analyzed oral reading errors made by first grade readers whose regular basal reader instruction was supplemented by rereading of text material for increased fluency and comprehension. In addition, the effects of repeated reading practice on sight vocabulary growth and oral reading fluency were also examined. This study additionally attempted to detect any differential effects of repeated reading practice on reading strategies of more able and less able first grade readers.

The analysis of oral reading errors focused on changes in a) use of graphic information, and b) use of contextual information. Successive monthly samples of oral reading errors on two different contextual presentations were examined. The two contextual presentations were selected from basal material and supplementary material. Sight vocabulary growth was assessed with the Johnson Basic

Sight Vocabulary Test.[1] Changes in oral reading fluency were measured with the Gray Oral Reading Tests.[2]

Subjects

Subjects for the study were fifty-two first grade students from two classes in a Chicago public elementary school. Subjects ranged in age from five years, three months to seven years, eight months (mean, six years, four months; N=fifty-two). The fifty-two subjects included twenty-nine girls and twenty-three boys. The student population of the school was drawn primarily from lower-middle to upper-lower class families.

Testing Instruments and Scoring Procedures

All subjects were administered the Johnson Basic Sight Vocabularly Test[3] and the Gray Oral Reading Tests[4] both prior to and at the conclusion of the study.

The Johnson Basic Sight Vocabulary Test is a set of ten thirty-item subtests designed for administration to groups of children in first grade, second grade, and remedial reading classes at all grade levels. Its purpose is to assess pupils' sight recognition of a basic vocabulary of three hundred high frequency words: one hundred eight words

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[1] Dale D. Johnson, Johnson Basic Sight Vocabulary Test (Lexington: Personnel Press, 1976).

[2] William S. Gray, Gray Oral Reading Tests (Indianapolis: The Bobbs-Merrill Company, 1967).

[3] Johnson.

[4] Gray.

are used at first grade and one hundred twenty words at second grade. Subtests one through six intended primarily for first grade children were used in the present study to assess subjects' sight vocabularies prior to and following treatment with repeated reading. Hoyt correlation ratios were calculated by the test author to determine reliability. The ratios were reported in the test manual as .89 for the first grade and .87 for the second grade.

Sight vocabulary growth, for the purposes of the present study, was viewed as indication of increased attention to intra-word graphic detail. The Johnson Basic Sight Vocabulary Test, because of its format, permitted pure measurement of attention to graphic detail. The subject was required to select from a row of words similar in appearance the word spoken by the test administrator. The task demanded use of graphic information only, since test words were not presented in connected discourse.

The Gray Oral Reading Tests were designed to provide an objective measure of growth in oral reading from early first grade to college. The tests consist of thirteen passages which range in difficulty from pre-primer level through college level. Oral reading errors, as well as reading time, are recorded. Both the number of errors and reading rate in seconds are used to determine grade equivalent scores. Testing is stopped when the subject produces seven or more errors on each of two consecutive passages. The tests were used in the present study to obtain an ob-

jective measure of subjects' oral reading fluency prior to and following treatment with repeated reading. Reliability of the tests was determined by calculation of coefficients of equivalence among the four forms of the tests. As reported in the test manual, the range for all subjects was from .973 to .982.

In addition to the aforementioned standardized test administrations, four successive monthly samples of oral reading were taken from all subjects. Each month for four months subjects read one selection from The Bookmark Library, a set of stories comprised of the same words introduced in The Bookmark Reading Program.[5] These four selections are referred to as basal material. The first two monthly selections were taken from the primer level material; the third and fourth monthly selections were taken from first reader material. The four selections were of nearly equal lengths: 234, 238, 226, and 245 words.

After reading the basal selection, subjects read one passage adapted from supplementary trade book material. The four trade book selections are referred to as supplementary material. The first two supplementary selections were taken from primer level material; the third and fourth monthly selections were taken from first reader level material. The lengths of these four passages were 252,

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[5] Margaret Early, Elizabeth K. Cooper, Nancy Santeusanio, and Marian Young Adell, The Bookmark Reading Program (New York: Harcourt Brace Jovanovich, 1974).

236, 243, and 243 words.[6]

Material was presented to each subject individually and each session was tape recorded. Both the examiner and the subject had a copy of the material to be read in front of them. The selection containing the basal material was always read first. As the subject read from his copy, the examiner recorded oral reading errors on another copy. The examiner recorded deviations from the printed text in pencil above the typed word on his copy of the selection. When the subject made no response to a stimulus word, the examiner allowed ten seconds to elapse before instructing the subject to go on to the next word. When an error response occurred, no attempt was made to supply the correct word or to otherwise indicate that the response had been incorrect.

Recording of Errors

The following types of errors were recorded:

1. No Response. Subject stopped reading just before a word it is assumed he did not know, or subject said, "I don't know that word." (This was indicated by the letters N.R.)

2. Insertion. Subject added a word or words while reading. (This was indicated by a caret at the point of insertion and writing the inserted word or words above the text line.)

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[6] Copies of all selections used for oral reading samples are included in Appendix A.

3. Omission. Subject skipped a word or words while reading. (This was indicated by a circle around the skipped word or words.)

4. Substitution. Subject said something other than the word on the page. This included both real and nonsense words. (This was indicated by writing the substituted word directly above the text word.)

5. Self-correction. Subject corrected error without any prompting. (This was indicated by writing a circled letter c next to the error.)

Analysis of Errors

Oral reading errors were analyzed to determine changes in subjects' use of graphic information and contextual information. Following the recommendations of Hood[7] concerning increased reliability of error analysis, all errors from each monthly sample were first analyzed for contextual acceptability, and then reanalyzed for graphic similarity to text words. Three judges independently analyzed error responses for contextual acceptability and graphic similarity to text words. These analyses were compared and any disagreements were mutually resolved.

Contextual acceptability of oral reading errors was determined according to procedures described by Hood.[8]

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[7] Joyce Hood, "Qualitative Analysis of Oral Reading Errors: the Inter-Judge Reliability of Scores," Reading Research Quarterly, XI (1975-1976): 577-598.

[8] Ibid.

The examiner read to himself the portion of a sentence containing an error just as the subject had read it, reading up to and including the error only (or one word past the error if it was an insertion, omission or no response). If the examiner felt that the sequence of words he had read could not occur as the beginning of a sensible sentence, the error was scored as not contextually acceptable (Not Context). If the sequence could begin a sensible sentence, he then read the entire sentence as the subject had read it up to and including the error, but continued on with the remainder of the sentence as it appeared in the text. If the error was acceptable, considering only the preceding context, it was scored as Pre-Context. If the error was contextually acceptable in the whole sentence but the meaning of the sentence differed from the author's intended meaning, the error was scored as Sen-Context. If the meaning of the sentence was equivalent to the meaning of the related sentence in the text, the error was scored as contextually acceptable in the passage as a whole (Pass-Context). For purposes of statistical analysis, errors scored as Not Context and Pre-Context were combined to form a single category, Contextualy Unacceptable. In a similar fashion, errors scored as Sen-Context and Pass-Context were combined to form the category, Contextually Acceptable.

Graphic similarity of substitution errors to text words was determined by using the graphic similarity index

devised by Weber.[9] The text word was compared to the error response with regard to the number of letters the words shared, the position of shared letters relative to each other, the average length of the words, and the difference in length between the text word and the error response.

The graphic similarity of each text word and each substitution response was computed according to the following formula:

$$GS = 10^{\frac{(50F+30V+10C)}{A}} + 5T + 27B + 18E$$

F = the number of pairs of adjacent letters in the same order shared by text and error (Text: house / Error: horse, F = 2; Text: every / Error: very, F = 3).

V = the number of pairs of adjacent letters in reverse order shared by text and error (Text: was / Error: saw, V = 2).

C = the number of single letters shared by text and error (Text: Spot / Error: Puff, C = 1; Text: family / Error: funny, C = 2).

A = average number of letters in text and error (Text: every / Error: very, A = 4.5).

T = ratio of number of letters in the shorter word to the number in the longer (Text: every / Error: very, T = 4/5).

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[9] Rose-Marie Weber, "A Linguistic Analysis of First Grade Errors," Reading Research Quarterly, V (1970): 428-451.

B = 1 if the first letter in the response was the same as the first letter in the text word; otherwise B = 0 (Text: family / Error: funny, B = 1).

E = 1 if the last letter in the response was the same as the last letter in the text word; otherwise E = 0 (Text: family / Error: funny, E = 1).

According to Weber,

> The weights assigned to the selected features reflect intuitions about the significance of various cues for the identification of words. For example, the greater weight given to shared beginning letters over end letters, and in turn the weight given to shared end letters over shared letters elsewhere in the word, reflect the importance of the positions of letters for word recognition. Because shared adjacent letter patterns reflect the formation of units of a higher order than single letters, special value is assigned to adjacent pairs, especially if the letters are in the same order. Since the number of shared single letters and adjacent pairs is a function of word length, the average number of letters was included in the formula.[10]

The graphic similarity index was calculated for only those substitution errors which shared letters with the text words so that errors with no shared letters were taken to have a graphic similarity score of zero.

Procedures

General

All subjects received regular daily reading instruction according to procedures prescribed in The Bookmark Reading Program.[11] First grade reading material in this

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[10] Ibid.

[11] Early, Cooper, Santeusanio, and Adell.

program consists of three preprimers, one primer, and the first reader. Instruction is implemented according to a reading unit plan which is comprised of several steps. Each reading unit begins with a word service lesson, during which sound-letter correspondences are introduced and reviewed. The remainder of each unit consists of preparation for reading, directed reading, building and extending skills, follow-up practice, and enrichment. Each reading unit is usually presented during a two-day period.

All subjects were pre-tested with the Gray Oral Reading Tests, Form A.[12] The median score on this pre-test was identified. Those subjects with scores at or above the median were designated as the high group; those with scores below the median were designated as the low group. Low group subjects were randomly assigned in equal numbers to experimental and control groups (LE and LC). The same procedure was followed with high group subjects, resulting in a second experimental group (HE) and a second control group (HC).

Experimental Groups LE and HE

All subjects in the experimental groups (LE and HE) received repeated reading practice for thirty minutes daily, for the duration of the four-month study. Initially, each subject selected a book for repeated reading practice. The subject then commenced repeated reading practice

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[12] Gray.

with the aid of a tape recorder and a tape recorded rendition of his book. Each subject was instructed to listen to the taped version while following along in the text, until he was able to read the book himself without access to the tape. The examiner also provided instruction concerning use of a tape recorder, and provided continued assistance when necessary.

Each subject was called upon by the examiner twice per week to read his selected book orally, without access to the taped version. The examiner recorded the reading rate and the number of word recognition errors on a graph for each book. Reading rate was determined with the aid of a stopwatch, and was recorded as words per minute. The subject then continued practicing the book at his desk, until called on by the examiner to read orally again. This sequence continued until the criterion rate of one hundred words per minute was reached. Then the subject began a new book.

Materials for repeated reading practice were trade books, usually consisting of a single story. In the case where a book contained more than one story, the experimental sequence described above was carried out with each story. Readability levels of the selected trade books ranged from primer level to third grade level.[13] An audio-tape rendition of each book was prepared by the ex-

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[13] Titles of all selections used for repeated reading practice are included in Appendix B.

aminer.

Control Groups (LC and HC)

During experimental training, control subjects received additional basal reading instruction, following the reading unit plan of The Bookmark Reading Program.[14]

Experimental Hypotheses and Statistical Design

The following null hypotheses were examined in this study:

1. First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in sight vocabulary growth over that of similar students who do not receive supplemental repeated reading practice.

2. First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant decrease in number of oral reading errors in connected discourse over that of similar students who do not receive supplemental repeated reading practice.

3. First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in graphic similarity of oral reading errors to text words in connected discourse over that of similar students who do not receive supplemental repeated reading practice.

4. First grade students whose regular reading in-

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[14] Early, Cooper, Santeusanio, and Adell.

struction is supplemented with repeated reading practice will show no significant increase in proportion of oral reading errors with both graphic similarity to text words and contextual acceptability over that of similar students who do not receive supplemental repeated reading practice.

5. First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in proportion of contextually unacceptable oral reading errors which are self-corrected over that of similar students who do not receive supplemental repeated reading practice.

6. First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in oral reading fluency over that of similar students who do not receive supplemental repeated reading practice.

7. Less able first grade students whose regular reading instruction is supplemented with repeated reading practice will show significantly less improvement than will more able first grade readers who do not receive supplemental repeated reading practice, in a) increase in sight vocabulary growth; b) decrease in number of oral reading errors in connected discourse; c) increase in graphic similarity of oral reading errors to text words; d) increase in proportion of oral reading errors with both graphic similarity to text words and contextual acceptability; 3) increase in proportion of contextually unacceptable oral

reading errors which are self-corrected; and f) increase in oral reading fluency.

In order to test the hypotheses of this study, a randomized 2 X 2 factorial design was employed. The first independent variable was repeated reading practice, with two levels: either subjects received this practice or they did not. The second independent variable was reading ability, with two levels: high and low. A subject's reading ability was designated as high if he scored at or above the median on the initial administration of the Gray Oral Reading Tests.[15] If a subject scored below the median on this test, his reading ability was designated as low.

A series of analyses of variance were performed to determine the effect, if any, of repeated reading practice on several dependent variables, and to determine the existence of any interaction between independent variables.

To determine the effect of repeated reading pratice on sight vocabulary growth, analysis of variance was performed on gain in number of words correctly identified from pre-test to post-test, using the Johnson Basic Sight Vocabularly Test.[16] To determine the effect of repeated reading practice on improvement in oral reading fluency, the dependent variables were gain from pre-test to post-test (expressed as a grade-equivalent score) on the Gray Oral

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[15] Gray.

[16] Johnson.

Reading Test,[17] and difference in number of words read per minute from month one to subsequent months on monthly oral reading samples.

In order to determine changes in subjects' use of graphic and contextual information during the four-month study, oral reading error scores from four monthly samples on both basal and transfer material were compared by means of analysis of variance. Dependent variables derived from monthly oral reading samples included: 1) difference in total errors; 2) difference in graphic similarity score for all substitution errors; 3) difference in average graphic similarity score for contextually acceptable substitutions; 4) difference in proportion of contextually acceptable substitutions to total substitutions; 5) difference in proportion of contextualy acceptable substitutions to total errors; and 6) difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors. In order to assess effects of repeated reading practice over the entire period of the study, as well as to detect changes which may have occurred from month to month, comparisons among results of oral reading samples were made in the following manner: 1) month one to month two; 2) month one to month three; 3) month one to month four.

To determine relative similarities among reading patterns of the LE and HC groups, t tests of difference be-

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[17] Gray.

tween means were applied to all of the aforementioned dependent variables for both groups. Comparisons were made for basal and supplementary presentations. Since persistent reading pattern similarities were of primary interest, only those comparisons reflecting change over the duration of the study (month one to month four) were considered.

Data collected in this study were prepared for analysis with the General Linear Models (GLM) procedure of the Statistical Analysis System (SAS).

CHAPTER IV

RESULTS

All subjects (N=52) in the study were pre-tested with the Gray Oral Reading Tests, Form A. The median score on this pre-test was a grade-equivalent of 1.15. Those subjects with scores at or above the median were designated as the high group; those with scores below the median were designated as the low group. Low group subjects were randomly assigned in equal numbers (N=13) to experimental and control groups (LE and LC). The same procedure was followed with high group subjects, resulting in a second experimental group (HE) and a second control group (HC).

The mean score and the standard deviation obtained on the Gray pre-test were computed for each group and are presented in Table 1:

TABLE 1 -- Mean grade-equivalent scores and standard deviations for experimental and control groups on the pre-test of the Gray Oral Reading Tests, Form A.

Group	Mean	Standard Deviation
HE	1.59	0.34
LE	1.10	0.00
HC	1.62	0.31
LC	1.10	0.00

In order to establish support for the arbitrarily designated high and low groups, a 2 X 2 analysis of variance was performed on the pre-test scores of the Gray Oral Reading Tests, Form A. The independent variables were repeated reading practice (received - E versus not received - C), and reading ability (high - H versus low - L). The results of this analysis are presented in Table 2:

TABLE 2 -- Analysis of variance on grade-equivalent pre-test scores of the Gray Oral Reading Tests, Form A.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	.31	1	.31	0.06	p<.8087
Reading Ability (B)	335.08	1	335.08	64.53	p<.0001*
A x B	.31	1	.31	0.06	p<.8087
Within Cell	249.23	48	5.19		

* Significant

This analysis indicated a significant main effect for the reading ability factor ($F = 64.53$; $p<.0001$). There were no significant effects for the repeated reading practice factor, nor for the interaction of repeated reading practice with reading ability. Examination of group mean scores (see Table 1) revealed that high group subjects (HE and HC) performed better than did low group subjects (LE and LC) on the initial test of oral reading fluency. These results substantiated the division of subjects into high and low groups for purposes of the present study. Since comparisons of primary concern to the investigation were HE versus HC and LE versus LC, a significant difference between ability groups was considered as supportive and beneficial to the study.

To test the hypotheses of this study, experimental and control groups were compared with respect to changes in oral reading skill and error patterns at designated points during and following experimental treatment. Data was computer analyzed with the General Linear Models (GLM) procedure of the Statistical Analysis Sytem (SAS). The independent variables for all 2 X 2 analyses of variance were repeated reading practice (received - E versus not received - C), and reading ability (high - H versus low - L).

Hypothesis 1

Alternate forms of the Johnson Basic Sight Vocabulary Test were administered to all subjects prior to and following the four month study. In order to assess sight vocabu-

lary change, group mean difference scores from pre-test to post-test were analyzed with a 2 X 2 analysis of variance. The dependent variable was change from pre-test to post-test in number of words correctly identified. The mean difference score and the standard deviation were computed for each group and are presented in Table 3. The results of the analysis of variance are presented in Table 4.

TABLE 3 -- Mean difference scores and standard deviations for experimental and control groups from pre-test to post-test on the Johnson Basic Sight Vocabulary Test.

Group	Mean	Standard Deviation
HE	10.07	9.25
LE	22.23	16.45
HC	9.00	7.57
LC	22.69	15.65

TABLE 4 -- Analysis of variance on difference scores from pre-test to post-test on the Johnson Basic Sight Vocabulary Test.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	1.23	1	1.23	0.01	p<.9315
Reading Ability (B)	2171.08	1	2171.08	13.18	p<.0007*
A x B	7.69	1	7.69	0.05	p<.8298
Within Cell	7904.00	48	164.67		

* Significant

This analysis of variance indicated that the reading ability factor had a significant effect on sight vocabulary change as measured in this study. There were no significant effects indicated for the repeated reading practice factor, nor for the interaction of the two factors. Examination of group mean difference scores (see Table 3) revealed that both low ability groups (LE and LC) achieved sight vocabulary gains more than twice as great as those of high ability groups.

In view of these findings, the following null hypothesis was accepted:

First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in sight vocabulary growth over that of similar students who do not receive supplemental repeated reading practice.

In order to assess change in oral reading error patterns in connected discourse, results of monthly oral reading samples on basal and supplementary passages were compared and analyzed. Results of the first monthly sample, taken after one month of experimental treatment, were used as baseline data. Results of subsequent monthly samples were compared with results of the first sample to determine differences in error patterns throughout the study. Analyses of these comparisons were used to test hypotheses two through six.

Hypothesis 2

To assess change in number of oral reading errors in connected discourse, group mean difference scores from month one to subsequent months were analyzed with a 2 X 2 analysis of variance. The dependent variable was total number of errors. Data for the basal material is presented first, followed by data for the supplementary material.

Basal material

The mean difference scores and the standard deviations were computed for each group and are presented in Tables 5, 6, and 7. Results of the analyses of variance are presented in Tables 8, 9, and 10.

TABLE 5 -- Mean difference in total errors and standard deviations for experimental and control groups from month one to month two on basal material.

Group	Mean	Standard Deviation
HE	1.38	5.45
LE	58.15	53.72
HC	3.92	12.33
LC	56.38	65.18

TABLE 6 -- Mean difference in total errors and standard deviations for experimental and control groups from month one to month three on basal material.

Group	Mean	Standard Deviation
HE	-7.15	7.35
LE	-1.15	48.09
HC	-8.08	8.26
LC	-14.85	43.58

TABLE 7 -- Mean difference in total errors and standard deviations for experimental and control groups from month one to month four on basal material.

Group	Mean	Standard Deviation
HE	-7.61	7.62
LE	-3.46	53.20
HC	-6.85	6.49
LC	-15.00	41.50

TABLE 8 -- Analysis of variance on difference in total errors from month one to month two on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	1.92	1	1.92	0.00	p<.9743
Reading Ability (B)	38776.92	1	38776.92	21.20	p<.0001*
A x B	60.31	1	60.31	0.03	p<.8567
Within Cell	87796.77	48	1829.10		

* Significant

TABLE 9 -- Analysis of variance on difference in total errors from month one to month three on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	694.23	1	694.23	0.64	p<.4274
Reading Ability (B)	1.92	1	1.92	0.00	p<.9666
A x B	529.92	1	529.92	0.49	p<.4878
Within Cell	52018.00	48	1083.71		

TABLE 10 -- Analysis of variance on difference in total errors from month one to month four on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	376.92	1	376.92	0.32	p<.5718
Reading Ability (B)	52.00	1	52.00	0.04	p<.8334
A x B	492.31	1	492.31	0.42	p<.5184
Within Cell	55832.00	48	1163.17		

Supplementary material

The mean difference scores and the standard deviations were computed for each group and are presented in Tables 11, 12, and 13. Results of analyses of variance are presented in Tables 14, 15, and 16.

TABLE 11 -- Mean difference in total errors and standard deviations for experimental and control groups from month one to month two on supplementary material.

Group	Mean	Standard Deviation
HE	-16.15	15.83
LE	3.23	56.18
HC	-17.46	11.08
LC	-8.92	96.38

TABLE 12 -- Mean difference in total errors and standard deviations for experimental and control groups from month one to month three on supplementary material.

Group	Mean	Standard Deviation
HE	-25.54	23.55
LE	-38.00	33.50
HC	-25.31	13.03
LC	-41.46	87.21

TABLE 13 -- Mean difference in total errors and standard deviations for experimental and control groups from month one to month four on supplementary material.

Group	Mean	Standard Deviation
HE	-11.46	14.51
LE	-27.00	39.09
HC	-7.46	10.63
LC	-32.15	83.44

TABLE 14 -- Analysis of variance on difference in total errors from month one to month two on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	588.94	1	588.94	0.18	p<.6701
Reading Ability (B)	2534.02	1	2534.02	0.79	p<.3783
A x B	382.33	1	382.33	0.12	p<.7313
Within Cell	153832.15	48	3204.84		

TABLE 15 -- Analysis of variance on difference in total errors from month one to month three on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	33.92	1	33.92	0.01	p<.9051
Reading Ability (B)	2661.23	1	2661.23	1.13	p<.2939
A x B	44.31	1	44.31	0.02	p<.8917
Within Cell	113429.23	48	2363.11		

TABLE 16 -- Analysis of variance on difference in total errors from month one to month four on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	4.33	1	4.33	0.00	p<.9648
Reading Ability (B)	5260.17	1	5260.17	2.39	p<.1289
A x B	272.33	1	272.33	0.12	p<.7267
Within Cell	105766.15	48	2203.46		

The preceding analyses of variance indicated one significant main effect for the reading ability factor (F = 212.0; p<.0001). This effect was detected on difference in total errors from month one to month two on basal material (see Table 8). Examination of group mean scores (see Table 5) for this time period on basal material revealed that both low groups had mean increases in total errors (LE, 58.15; LC, 56.38). No other significant main effects or interactive effects were indicated over the various time periods, nor over the two sets of reading material.

In view of these findings, the following null hypothesis was accepted:

First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant decrease in number of oral reading errors in connected discourse over that of similar students

who do not receive supplemental repeated reading practice.

Hypothesis 3

To assess change in graphic similarity of oral reading errors to text words in connected discourse, group mean difference scores from month one to subsequent months were analyzed with a 2 X 2 analysis of variance. The dependent variable was graphic similarity score (total graphic similarity score ÷ total substitution errors, since graphic similarity score was computed only for substitution errors). Data for the basal material is presented first, followed by data for the supplementary material.

Basal material

The mean difference scores and the standard deviations were computed for each group and are presented in Tables 17, 18, and 19. Results of the analyses of variance are presented in Tables 20, 21, and 22.

TABLE 17 -- Mean difference in graphic similarity score and standard deviations for experimental and control groups from month one to month two on basal material.

Group	Mean	Standard Deviation
HE	121.88	89.75
LE	17.82	81.82
HC	90.15	87.52
LC	25.37	91.66

TABLE 18 -- Mean difference in graphic similarity score and standard deviations for experimental and control groups from month one to month three on basal material.

Group	Mean	Standard Deviation
HE	31.41	80.30
LE	-3.84	48.36
HC	8.67	145.20
LC	-18.50	78.93

TABLE 19 -- Mean difference in graphic similarity score and standard deviations for experimental and control groups from month one to month four on basal material.

Group	Mean	Standard Deviation
HE	53.83	73.18
LE	12.92	65.23
HC	-17.99	144.96
LC	-10.97	82.57

TABLE 20 -- Analysis of variance on difference in graphic similarity score from month one to month two on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	1900.10	1	1900.10	0.25	p<.6217
Reading Ability (B)	92644.19	1	92644.19	12.03	p<.0011*
A x B	5012.41	1	5012.41	0.65	p<.4238
Within Cell	369724.34	48	7702.59		

* Significant

TABLE 21 -- Analysis of variance on difference in graphic similarity score from month one to month three on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	4545.25	1	4545.25	0.50	p<.4813
Reading Ability (B)	12662.94	1	12662.94	1.40	p<.2420
A x B	211.87	1	211.87	0.02	p<.8789
Within Cell	433175.05	48	9024.48		

TABLE 22 -- Analysis of variance on difference in graphic similarity score from month one to month four on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	29772.61	1	29772.61	3.18	p<.0808
Reading Ability (B)	3733.02	1	3733.02	0.40	p<.5307
A x B	7467.95	1	7467.95	0.80	p<.3762
Within Cell	449311.78	48	9360.66		

Supplementary material

The mean difference scores and the standard deviations were computed for each group and are presented in Tables 23, 24, and 25. Results of analyses of variance are presented in Tables 26, 27, and 28.

TABLE 23 -- Mean difference in graphic similarity score and standard deviations for experimental and control groups from month one to month two on supplementary material.

Group	Mean	Standard Deviation
HE	16.63	102.67
LE	-17.54	72.03
HC	14.97	61.75
LC	-30.12	117.34

TABLE 24 -- Mean difference in graphic similarity score and standard deviations for experimental and control groups from month one to month three on supplementary material.

Group	Mean	Standard Deviation
HE	-48.37	91.42
LE	-23.23	39.81
HC	-21.15	101.64
LC	-39.98	90.42

TABLE 25 -- Mean difference in graphic similarity score and standard deviations for experimental and control groups from month one to month four on supplementary material.

Group	Mean	Standard Deviation
HE	-22.16	89.90
LE	-14.02	66.18
HC	-5.06	81.25
LC	-38.15	96.30

TABLE 26 -- Analysis of variance on difference in graphic similarity score from month one to month two on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	658.15	1	658.15	0.08	p<.7798
Reading Ability (B)	20414.87	1	20414.87	2.45	p<.1240
A x B	387.19	1	387.19	0.05	p<.8302
Within Cell	399750.69	48	8328.14		

TABLE 27 -- Analysis of variance on difference in graphic similarity score from month one to month three on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	356.33	1	356.33	0.05	p<.8238
Reading Ability (B)	129.04	1	129.04	0.02	p<.8934
A x B	6283.59	1	6283.59	0.88	p<.3520
Within Cell	341392.06	48	7112.33		

TABLE 28 -- Analysis of variance on difference in graphic similarity score from month one to month four on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	160.32	1	160.32	0.02	p<.8811
Reading Ability (B)	2021.96	1	2021.96	0.29	p<.5956
A x B	5523.10	1	5523.10	0.78	p<.3817
Within Cell	340046.05	48	7084.29		

The preceding analyses of variance indicated one significant main effect for the reading ability factor (F = 12.03; p<.0011). This effect was detected on difference in graphic similarity score from month one to month two on basal material (see Table 20). Examination of group mean scores (see Table 17) for this time period on basal material revealed that both high groups had large mean increases (HE, 121.88; HC, 90.15) in graphic similarity score relative to those of the low groups (LE, 17.82; LC, 25.37). No other significant main effects or interactive effects were indicated over the various time periods, nor over the two sets of reading material.

The effect of repeated reading practice, however, approached significance (F = 3.18; p<.0808) on difference in graphic similarity score from month one to month four on basal material (see Table 22). Examination of group mean

scores (see Table 19) for this time period on basal material indicated that both experimental groups had net mean increases (HE, 53.83; LE, 12.92) in graphic similarity score, whereas both control groups had net mean decreases (HC, -17.99; LC, -10.97).

In view of these findings, the following null hypothesis was accepted:

First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in graphic similarity of oral reading errors to text words in connected discourse over that of similar students who do not receive supplemental repeated reading practice.

Hypothesis 4

To assess change in proportion of oral reading errors with both graphic similarity to text words and contextual acceptability, group mean difference scores from month one to subsequent months were analyzed with a 2 X 2 analysis of variance. Contextually acceptable errors included those scored as Sen-Context and those scored as Pass-Context.

Dependent variables were: 1) graphic similarity score of contextually acceptable substitution errors; 2) proportion of contextually acceptable substitution errors to total substitution errors; and 3) proportion of contextually acceptable substitution errors to total errors. The dependent variables were selected to provide a complete representation of change in both graphic similarity and

contextual acceptability, since graphic similarity score was computed only for substitution errors. Data for the basal material is presented first, followed by data for the supplementary material.

Basal material

Graphic similarity score of contextually acceptable substitution errors. The mean difference scores and the standard deviations were computed for each group and are presented in Tables 29, 30 and 31. Results of analyses of variance are presented in Tables 32, 33, and 34.

TABLE 29 -- Mean difference in graphic similarity score of contextually acceptable substitution errors and standard deviations for experimental and control groups from month one to month two on basal material.

Group	Mean	Standard Deviation
HE	68.13	174.10
LE	-49.94	169.76
HC	86.12	161.28
LC	-3.76	167.84

TABLE 30 -- Mean difference in graphic similarity score of contextually acceptable substitution errors and standard deviations for experimental and control groups from month one to month three on basal material.

Group	Mean	Standard Deviation
HE	-10.79	113.49
LE	-14.51	124.41
HC	0.85	164.24
LC	-44.65	147.53

TABLE 31 -- Mean difference in graphic similarity score of contextually acceptable substitution errors and standard deviations for experimental and control groups from month one to month four on basal material.

Group	Mean	Standard Deviation
HE	-2.21	119.23
LE	-48.12	131.74
HC	-84.53	138.33
LC	-30.83	121.55

TABLE 32 -- Analysis of variance on difference in graphic similarity score of contextually acceptable substitution errors from month one to month two on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	13385.73	1	13385.73	0.47	p<.4951
Reading Ability (B)	140533.57	1	140533.57	4.96	p<.0306*
A x B	2581.88	1	2581.88	0.09	p<.7640
Within Cell	1359744.06	48	28328.00		

* Significant

TABLE 33 -- Analysis of variance on difference in graphic similarity score of contextually acceptable substitution errors from month one to month three on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	1112.30	1	1112.30	0.06	p<.8112
Reading Ability (B)	7872.52	1	7872.52	0.41	p<.5258
A x B	5672.70	1	5672.70	0.29	p<.5900
Within Cell	925195.19	48	19274.90		

TABLE 34 -- Analysis of variance on difference in graphic similarity score of contextually acceptable substitution errors from month one to month four on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	13745.43	1	13745.43	0.84	p<.3641
Reading Ability (B)	196.90	1	196.90	0.01	p<.9131
A x B	32244.81	1	32244.81	1.97	p<.1669
Within Cell	785797.09	48	16370.77		

Proportion of contextually acceptable substitution errors to total substitution errors. The mean difference scores and the standard deviations were computed for each group and are presented in Tables 35, 36 and 37. Results of analyses of variance are presented in Tables 38, 39, and 40.

TABLE 35 -- Mean difference in proportion of contextually acceptable substitution errors to total substitution errors and standard deviations for experimental and control groups from month one to month two on basal material.

Group	Mean	Standard Deviation
HE	-0.11	0.41
LE	0.03	0.15
HC	-0.12	0.36
LC	-0.11	0.12

TABLE 36 -- Mean difference in proportion of contextually acceptable substitution errors to total substitution errors and standard deviations for experimental and control groups from month one to month three on basal material.

Group	Mean	Standard Deviation
HE	-0.06	0.32
LE	0.06	0.18
HC	-0.09	0.54
LC	0.61	2.41

TABLE 37 -- Mean difference in proportion of contextually acceptable substitution errors to total substitution errors and standard deviations for experimental and control groups from month one to month four on basal material.

Group	Mean	Standard Deviation
HE	-0.06	0.20
LE	0.00	0.07
HC	-0.28	0.36
LC	0.07	0.14

TABLE 38 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total substitution errors from month one to month two on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.07	1	0.07	0.81	p<.3728
Reading Ability (B)	0.07	1	0.07	0.81	p<.3728
A x B	0.05	1	0.05	0.55	p<.4600
Within Cell	3.99	48	0.08		

TABLE 39 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total substitution errors from month one to month three on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.84	1	0.84	0.54	p<.4661
Reading Ability (B)	2.21	1	2.21	1.42	p<.2396
A x B	1.12	1	1.12	0.72	p<.4013
Within Cell	74.69	48	1.56		

TABLE 40 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total substitution errors from month one to month four on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.27	1	0.27	5.51	p<.0231*
Reading Ability (B)	0.22	1	0.22	4.52	p<.0387*
A x B	0.07	1	0.07	1.50	p<.2236
Within Cell	2.36	48	0.05		

*Significant

Proportion of contextually acceptable substitution errors to total errors. The mean difference scores and the standard deviations were computed for each group and are presented in Tables 41, 42 and 43. Results of analyses of variance are presented in Tables 44, 45, and 46.

TABLE 41 -- Mean difference in proportion of contextually acceptable substitution errors to total errors and standard deviations for experimental and control groups from month one to month two on basal material.

Group	Mean	Standard Deviation
HE	-0.02	0.25
LE	0.02	0.11
HC	-0.13	0.25
LC	-0.04	0.05

TABLE 42 -- Mean difference in proportion of contextually acceptable substitution errors to total errors and standard deviations for experimental and control groups from month one to month three on basal material.

Group	Mean	Standard Deviation
HE	-0.03	0.21
LE	0.05	0.12
HC	-0.08	0.46
LC	0.58	2.12

TABLE 43 -- Mean difference in proportion of contextually acceptable substitution errors to total errors and standard deviations for experimental and control groups from month one to month four on basal material.

Group	Mean	Standard Deviation
HE	-0.01	0.15
LE	0.01	0.05
HC	-0.23	0.31
LC	-0.01	0.07

TABLE 44 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total errors from month one to month two on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.09	1	0.09	2.67	p<.1090
Reading Ability (B)	0.05	1	0.05	1.46	p<.2325
A x B	0.01	1	0.01	0.32	p<.5771
Within Cell	1.68	48	0.03		

TABLE 45 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total errors from month one to month three on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.72	1	0.72	0.60	p<.4418
Reading Ability (B)	1.77	1	1.77	1.49	p<.2286
A x B	1.09	1	1.98	0.91	p<.3439
Within Cell	57.06	48	1.19		

TABLE 46 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total errors from month one to month four on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.19	1	0.19	6.03	p<.0178*
Reading Ability (B)	0.20	1	0.20	6.15	p<.0167*
A x B	0.14	1	0.14	4.33	p<.0429*
Within Cell	1.53	48	0.03		

*Significant

Supplementary material

Graphic similarity score of contextually acceptable substitution errors. The mean difference scores and the standard deviations were computed for each group and are presented in Tables 47, 48, and 49. Results of analyses of variance are presented in Tables 50, 51, and 52.

TABLE 47 -- Mean difference in graphic similarity score of contextually acceptable substitution errors and standard deviations for experimental and control groups from month one to month two on supplementary material.

Group	Mean	Standard Deviation
HE	30.54	197.43
LE	-1.44	84.30
HC	69.49	126.09
LC	10.06	242.41

TABLE 48 -- Mean difference in graphic similarity score of contextually acceptable substitution errors and standard deviations for experimental and control groups from month one to month three on supplementary material.

Group	Mean	Standard Deviation
HE	-64.40	184.74
LE	-51.69	102.18
HC	-67.72	158.30
LC	-83.20	168.10

TABLE 49 -- Mean difference in graphic similarity score of contextually acceptable substitution errors and standard deviations for experimental and control groups from month one to month four on supplementary material.

Group	Mean	Standard Deviation
HE	25.50	161.56
LE	-60.17	88.20
HC	54.46	159.99
LC	-47.95	166.61

TABLE 50 -- Analysis of variance on difference in graphic similarity score of contextually acceptable substitution errors from month one to month two on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	8272.16	1	8272.16	0.27	p<.6030
Reading Ability (B)	27154.82	1	27154.82	0.90	p<.3476
A x B	2448.93	1	2448.93	0.08	p<.7770
Within Cell	1448919.28	48	30185.82		

TABLE 51 -- Analysis of variance on difference in graphic similarity score of contextually acceptable substitution errors from month one to month three on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	3944.08	1	3944.08	0.16	p<.6899
Reading Ability (B)	24.95	1	24.95	0.00	p<.9747
A x B	2583.87	1	2583.87	0.11	p<.7466
Within Cell	1174607.09	48	24470.98		

TABLE 52 -- Analysis of variance on difference in graphic similarity score of contextually acceptable substitution errors from month one to month four on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	5513.26	1	5513.26	0.25	p<.6174
Reading Ability (B)	114981.10	1	114981.10	5.27	p<.0261*
A x B	910.50	1	910.50	0.04	p<.8390
Within Cell	1046852.98	48	21809.44		

* Significant

Proportion of contextually acceptable substitution errors to total substitution errors. The mean difference scores and the standard deviations were computed for each group and are presented in Tables 53, 54, and 55. Results of analyses of variance are presented in Tables 56, 57, and 58.

TABLE 53 -- Mean difference in proportion of contextually acceptable substitution errors to total substitution errors and standard deviations for experimental and control groups from month one to month two on supplementary material.

Group	Mean	Standard Deviation
HE	0.01	0.20
LE	0.09	0.13
HC	0.17	0.19
LC	-0.03	0.12

TABLE 54 -- Mean difference in proportion of contextually acceptable substitution errors to total substitution errors and standard deviations for experimental and control groups from month one to month three on supplementary material.

Group	Mean	Standard Deviation
HE	-0.10	0.23
LE	0.02	0.07
HC	-0.05	0.31
LC	-0.01	0.14

TABLE 55 -- Mean difference in proportion of contextually acceptable substitution errors to total substitution errors and standard deviations for experimental and control groups from month one to month four on supplementary material.

Group	Mean	Standard Deviation
HE	-0.07	0.18
LE	0.01	0.08
HC	-0.02	0.23
LC	-0.02	0.11

TABLE 56 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total substitution errors from month one to month two on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.01	1	0.01	0.20	p<.6574
Reading Ability (B)	0.04	1	0.04	1.49	p<.2284
A x B	0.26	1	0.26	9.51	p<.0034*
Within Cell	1.32	48	0.03		

* Significant

TABLE 57 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total substitution errors from month one to month three on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.00	1	0.00	0.01	p<.9093
Reading Ability (B)	0.07	1	0.07	1.65	p<.2050
A x B	0.02	1	0.02	0.43	p<.5175
Within Cell	2.15	48	0.04		

TABLE 58 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total substitution errors from month one to month four on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.00	1	0.00	0.06	p<.8081
Reading Ability (B)	0.02	1	0.02	0.93	p<.3409
A x B	0.02	1	0.02	0.63	p<.4297
Within Cell	1.26	48	0.03		

Proportion of contextually acceptable substitution errors to total errors. The mean difference scores and the standard deviations were computed for each group and are presented in Tables 59, 60, and 61. Results of analyses of

variance are presented in Tables 62, 63, and 64.

TABLE 59 -- Mean difference in proportion of contextually acceptable substitution errors to total errors and standard deviations for experimental and control groups from month one to month two on supplementary material.

Group	Mean	Standard Deviation
HE	0.03	0.17
LE	0.05	0.08
HC	0.10	0.15
LC	-0.01	0.05

TABLE 60 -- Mean difference in proportion of contextually acceptable substitution errors to total errors and standard deviations for experimental and control groups from month one to month three on supplementary material.

Group	Mean	Standard Deviation
HE	-0.06	0.19
LE	0.02	0.06
HC	-0.07	0.20
LC	-0.01	0.05

TABLE 61 -- Mean difference in proportion of contextually acceptable substitution errors to total errors and standard deviations for experimental and control groups from month one to month four on supplementary material.

Group	Mean	Standard Deviation
HE	-0.04	0.12
LE	0.00	0.04
HC	-0.04	0.17
LC	0.00	0.06

TABLE 62 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total errors from month one to month two on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.00	1	0.00	0.00	p<.9789
Reading Ability (B)	0.03	1	0.03	1.71	p<.1966
A x B	0.05	1	0.05	3.49	p<.0680
Within Cell	0.73	48	0.02		

TABLE 63 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total errors from month one to month three on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.01	1	0.01	0.37	p<.5445
Reading Ability (B)	0.06	1	0.06	2.94	p<.0927
A x B	0.00	1	0.00	0.07	p<.7969
Within Cell	0.96	48	0.02		

TABLE 64 -- Analysis of variance on difference in proportion of contextually acceptable substitution errors to total errors from month one to month four on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.00	1	0.00	0.02	p<.8970
Reading Ability (B)	0.02	1	0.02	1.80	p<.1855
A x B	0.00	1	0.00	0.00	p<.9700
Within Cell	0.58	48	0.01		

The analyses of variance concerned with change in graphic similarity score of contextually acceptable substitution errors indicated two instances of main effect for the reading ability factor. The first of these significant

effects ($F = 4.96$; $p<.0306$) occurred from month one to month two on basal material (see Table 32). Examination of group mean scores (see Table 29) for this time period on basal material showed that both high groups had large mean increases (HE, 68.13; HC, 86.12) in graphic similarity score of contextually acceptable substitution errors, as contrasted with mean decreases (LE, -49.94; LC, -3.76) for the low groups.

The second significant effect ($F = 5.27$; $p<.0261$) for the reading ability factor on graphic similarity score of contextually acceptable substitution errors occurred from month one to month four on supplementary material (see Table 52). Examination of group mean scores (see Table 49) for this time period on supplementary material revealed mean increases (HE, 25.50; HC, 54.46) for both high ability groups in graphic similarity score of contextually acceptable substitution errors, relative to mean decreases (LE, -60.17; LC, -47.95) for both low ability groups.

The analyses of variance concerned with change in proportion of contextually acceptable substitution errors to total substitution errors indicated instances of main effect for both repeated reading practice and reading ability, as well as one instance of significant interaction. On basal material from month one to month four (see Table 40), significant effects were detected for repeated reading practice ($F = 5.51$; $p<.0231$) and for reading ability ($F = 4.52$; $p<.0387$). Examination of group mean scores (see

Table 37) for this time period on basal material indicated that experimental subjects experienced a smaller net decrease (HE, -0.06; LE, 0.00) in proportion of contextually acceptable substitution errors to total substitution errors than did control subjects (HC, -0.28; LC, -0.07). In addition, low ability subjects experienced a smaller net decrease (LE, 0.00; LC, -0.07) than did high ability subjects (HE, -0.06; HC, -0.28).

On supplementary material from month one to month two (see Table 56), significant interaction ($F = 9.51$; $p<.0034$) of repeated reading practice and reading ability was detected. Examination of group mean scores (see Table 53) for this time period on supplementary material revealed that low ability experimental subjects and high ability control subjects experienced greater increase (LE, 0.09; HC, 0.17) in proportion of contextually acceptable substitution errors to total substitution errors than did other subjects.

The analyses of variance concerned with change in proportion of contextually acceptable substitution errors to total errors indicated instances of significant effect for repeated reading practice, reading ability, and for the interaction of these two factors. On basal material from month one to month four (see Table 46), significant effects were detected for repeated reading practice ($F = 6.03$; $p<.0178$) and for reading ability ($F = 6.15$; $p<.0429$). In the same time period on basal material, however, signifi-

cant interaction ($F = 4.33$; $p<.0429$) of the two factors was detected. Examination of group mean scores (see Table 43) for this time period on basal material revealed that low ability experimental subjects experienced greater increase (LE, 0.01) and high ability subjects experienced greater decrease (HC, -0.23) in proportion of contextually acceptable substitution errors to total errors than did other subjects.

No other significant main effects or interactive effects were indicated over the various time periods, nor over the two sets of reading material, for any of the three dependent variables.

To summarize results of analyses of change in dependent variables considered under the fourth hypothesis, the following table of significant effects is presented.

TABLE 65 -- Summary of significant effects on three dependent variables considered under Hypothesis 4.

Variable	Time Period (Months) 1-2	1-3	1-4
GSS of Contextually Acceptable Substitution Errors	(b)RA(H+,L-)		(s)RA(H+,L-)
Proportion of Contextually Acceptable Substitution Errors to Total Substitution Errors	(s)RRPx RA(LE+,HC+)		(b)RRP(C-) (b)RA(HC-)
Proportion of Contextually Acceptable Substitution Errors to Total Errors			(b)RRPx RA(LE+,HC-)

b = Basal Material
s = Supplementary Material
RA = Reading Ability
RRP = Repeated Reading Practice
+ = Increase
- = Decrease

In view of the findings presented in this section and summarized in Table 65, the following null hypothesis was accepted:

First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in proportion of oral reading errors with both graphic similarity to text words and contextual acceptability over that of similar students who do not receive supplemental repeated reading practice.

Hypothesis 5

To assess change in proportion of contextually unacceptable oral reading errors which are self-corrected,

group mean difference scores from month one to subsequent months were analyzed with a 2 X 2 analysis of variance. Contextually unacceptable errors included those scored as Not Context and those scored as Pre-Context. The dependent variable was proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors. Data for the basal material is presented first, followed by data for the supplementary material.

Basal material

The mean difference scores and the standard deviations were computed for each group and are presented in Tables 66, 67, and 68. Results of analyses of variance are presented in Tables 69, 70, and 71.

TABLE 66 -- Mean difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors and standard deviations for experimental and control groups from month one to month two on basal material.

Group	Mean	Standard Deviation
HE	0.01	0.23
LE	-0.06	0.08
HC	-0.06	0.31
LC	-0.03	0.08

TABLE 67 -- Mean difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors and standard deviations for experimental and control groups from month one to month three on basal material.

Group	Mean	Standard Deviation
HE	0.17	0.37
LE	0.06	0.15
HC	0.02	0.40
LC	0.07	0.19

TABLE 68 -- Mean difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors and standard deviations for experimental and control groups from month one to month four on basal material.

Group	Mean	Standard Deviation
HE	0.10	0.27
LE	0.05	0.21
HC	0.18	0.35
LC	0.10	0.18

TABLE 69 -- Analysis of variance on difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors from month one to month two on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.004	1	0.004	0.10	p<.7529
Reading Ability (B)	0.004	1	0.004	0.09	p<.7630
A x B	0.032	1	0.032	0.79	p<.3794
Within Cell	1.939	48	0.040		

TABLE 70 -- Analysis of variance on difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors from month one to month three on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.060	1	0.060	0.67	p<.4165
Reading Ability (B)	0.012	1	0.012	0.13	p<.7199
A x B	0.085	1	0.085	0.95	p<.3348
Within Cell	4.294	48	0.089		

TABLE 71 -- Analysis of variance on difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors from month one to month four on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.051	1	0.051	0.75	p<.3904
Reading Ability (B)	0.057	1	0.057	0.83	p<.3670
A x B	0.004	1	0.004	0.06	p<.8095
Within Cell	3.272	48	0.068		

Supplementary material

The mean difference scores and the standard deviations were computed for each group and are presented in Tables 72, 73, and 74. Results of analyses of variance are presented in Tables 75, 76, and 77.

TABLE 72 -- Mean difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors and standard deviations for experimental and control groups from month one to month two on supplementary material.

Group	Mean	Standard Deviation
HE	0.02	0.36
LE	0.01	0.04
HC	0.10	0.27
LC	-0.19	0.68

TABLE 73 -- Mean difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors and standard deviations for experimental and control groups from month one to month three on supplementary material.

Group	Mean	Standard Deviation
HE	0.10	0.32
LE	0.02	0.05
HC	0.06	0.26
LC	-0.16	0.69

TABLE 74 -- Mean difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors and standard deviations for experimental and control groups from month one to month four on supplementary material.

Group	Mean	Standard Deviation
HE	-0.01	0.17
LE	0.00	0.06
HC	-0.01	0.10
LC	-0.18	0.68

TABLE 75 -- Analysis of variance on difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors from month one to month two on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.050	1	0.050	0.30	p<.5861
Reading Ability (B)	0.270	1	0.270	1.61	p<.2107
A x B	0.261	1	0.261	1.55	p<.2188
Within Cell	8.062	48	0.168		

TABLE 76 -- Analysis of variance on difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors from month one to month three on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.152	1	0.152	0.94	p<.3366
Reading Ability (B)	0.305	1	0.305	1.89	p<.1753
A x B	0.062	1	0.062	0.38	p<.5392
Within Cell	7.744	48	0.161		

TABLE 77 -- Analysis of variance on difference in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors from month one to month four on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	0.116	1	0.116	0.27	p<.6066
Reading Ability (B)	0.084	1	0.084	1.59	p<.2128
A x B	0.116	1	0.116	1.96	p<.1676
Within Cell	6.042	48	0.126		

The preceding analyses of variance indicated no significant main effects or interactive effects over the various time periods, nor over the two sets of reading material.

In view of these findings, the following null hypothesis was accepted:

First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in proportion of contextually unacceptable oral reading errors which are self-corrected over that of similar students who do not receive supplemental repeated reading practice.

Hypothesis 6

To assess change in oral reading fluency, group mean difference scores on two dependent variables were analyzed

with a 2 X 2 analysis of variance. The first dependent variable was difference in grade equivalent score from pre-test to post-test on the Gray Oral Reading Tests. The second dependent variable was difference in reading rate, measured in number of words read per minute, on monthly reading samples from month one to subsequent months.

The mean difference score from pre-test to post-test on the Gray and the standard deviation were computed for each group and are presented in Table 78. The results of the analysis of variance are presented in Table 79. Subsequently, reading rate data for the basal material is presented, followed by data for the supplementary material.

TABLE 78 -- Mean difference grade equivalent scores and standard deviations for experimental and control groups from pre-test to post-test on the Gray Oral Reading Test.

Group	Mean	Standard Deviation
HE	0.7	0.4
LE	0.4	0.3
HC	0.4	0.4
LC	0.2	0.2

TABLE 79 -- Analysis of variance on difference scores from pre-test to post-test on the Gray Oral Reading Test.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	4.808	1	4.808	4.86	p<.0323*
Reading Ability (B)	8.377	1	8.377	8.47	p<.0055*
A x B	0.277	1	0.277	0.28	p<.5991
Within Cell	47.461	48	0.989		

* Significant

Basal material

The mean difference scores and the standard deviations were computed for each group and are presented in Tables 80, 81, and 82. Results of analyses of variance are presented in Tables 83, 84, and 85.

TABLE 80 -- Mean difference in number of words read per minute and standard deviations for experimental and control groups from month one to month two on basal material.

Group	Mean	Standard Deviation
HE	3.34	14.46
LE	2.21	11.11
HC	3.48	20.62
LC	-2.78	17.90

TABLE 81 -- Mean difference in number of words read per minute and standard deviations for experimental and control groups from month one to month three on basal material.

Group	Mean	Standard Deviation
HE	17.10	13.84
LE	15.07	16.62
HC	21.19	20.75
LC	5.48	12.56

TABLE 82 -- Mean difference in number of words read per minute and standard deviations for experimental and control groups from month one to month four on basal material.

Group	Mean	Standard Deviation
HE	18.20	13.66
LE	20.70	18.56
HC	27.68	35.02
LC	14.81	23.92

TABLE 83 -- Analysis of variance on difference in number of words read per minute from month one to month two on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	76.327	1	76.327	0.28	p<.5971
Reading Ability (B)	177.231	1	177.231	0.66	p<.4215
A x B	85.299	1	85.299	0.32	p<.5774
Within Cell	12939.606	48	269.575		

TABLE 84 -- Analysis of variance on difference in number of words read per minute from month one to month three on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	98.313	1	98.313	0.37	p<.5446
Reading Ability (B)	1023.509	1	1023.509	3.88	p<.0547*
A x B	608.623	1	608.623	2.31	p<.1355
Within Cell	12670.940	48	263.978		

*Significant

TABLE 85 -- Analysis of variance on difference in number of words read per minute from month one to month four on basal material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	41.761	1	41.761	0.07	p<.7900
Reading Ability (B)	349.443	1	349.443	0.60	p<.4424
A x B	767.693	1	767.693	1.32	p<.2566
Within Cell	27953.012	48	582.354		

Supplementary material

The mean difference scores and the standard deviations were computed for each group and are presented in Tables 86, 87, and 88. Results of analyses of variance are presented in Tables 89, 90, and 91.

TABLE 86 -- Mean difference in number of words read per minute and standard deviations for experimental and control groups from month one to month two on supplementary material.

Group	Mean	Standard Deviation
HE	9.39	10.04
LE	5.28	11.49
HC	3.90	13.92
LC	-13.49	24.71

TABLE 87 -- Mean difference in number of words read per minute and standard deviations for experimental and control groups from month one to month three on supplementary material.

Group	Mean	Standard Deviation
HE	28.71	15.93
LE	8.88	17.43
HC	22.99	18.68
LC	-5.95	20.49

TABLE 88 -- Mean difference in number of words read per minute and standard deviations for experimental and control groups from month one to month four on supplementary material.

Group	Mean	Standard Deviation
HE	15.12	13.03
LE	9.05	16.78
HC	11.79	15.16
LC	-13.22	25.39

TABLE 89 -- Analysis of variance on difference in number of words read per minute from month one to month two on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	1914.235	1	1914.235	7.38	p<.0091*
Reading Ability (B)	1502.313	1	1502.313	5.79	p<.0200*
A x B	573.563	1	573.563	2.21	p<.1435
Within Cell	12450.035	48	259.376		

*Significant

TABLE 90 -- Analysis of variance on difference in number of words read per minute from month one to month three on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	1370.942	1	1370.942	4.14	p<.0476*
Reading Ability (B)	7729.923	1	7729.923	23.31	p<.0001*
A x B	269.588	1	269.588	0.81	p<.3717
Within Cell	15914.174	48	331.545		

*Significant

TABLE 91 -- Analysis of variance on difference in number of words read per minute from month one to month four on supplementary material.

Source of Variance	Sum of Squares	df	Mean Square	F	Level of Significance
Repeated Reading Practice (A)	2129.920	1	2129.920	6.43	p<.0146*
Reading Ability (B)	3138.769	1	3138.769	9.47	p<.0034*
A x B	1167.557	1	1167.557	3.52	p<.0666
Within Cell	15911.802	48	331.496		

*Significant

The analysis of variance concerned with change from pre-test to post-test on the Gray Oral Reading Tests (see Table 79) indicated significant main effect for both repeated reading practice ($F = 4.86$; $p<.0323$) and reading ability ($F = 8.47$; $p<.0055$). Examination of group mean difference scores (see Table 78) revealed that experimental subjects experienced greater overall increases (HE, 0.7; LE, 0.4) in grade equivalent score from pre-test to post-test on the Gray than did control subjects (HC, 0.4; LC, 0.2). In addition, high ability subjects showed greater overall increases (HE, 0.7; HC, 0.4) than did low ability subjects (LE, 0.4; LC, 0.2).

The analyses of variance concerned with change in number of words read per minute on basal material indicated a significant effect ($F - 3.88$; $p<.0547$) for reading abil-

ity from month one to month three (see Table 84). Examination of group mean difference scores for this time period (see Table 81) showed that high ability subjects had greater increase (HE, 17.10; HC, 21.19) in number of words read per minute that did low ability subjects (LE, 15.07; LC, 5.48).

On supplementary material, the analyses of variance concerned with change in number of words read per minute indicated significant main effect for both repeated reading practice and reading ability from month one to month two (see Table 89; RRP, $F = 7.38$, $p<.0091$; RA, $F = 5.79$, $p<.0200$), from month one to month three (see Table 90; RRP, $F = 4.14$, $p<.0476$; RA, $F = 23.31$, $p<.0001$), and from month one to month four (see Table 91; RRP, $F = 6.43$, $p<.0146$; RA, $F = 9.47$, $p<.0034$). Examination of group mean difference scores from month one to month two (see Table 86) revealed that experimental subjects experienced greater increase (HE, 9.39; LE, 5.28) in number of words read per minute than did control subjects (HC, 3.90; LC, -13.49). In addition, high ability subjects showed greater rate improvement (HE, 9.39; HC, 3.90) than did low ability subjects (LE, 5.28; LC, -13.49).

A similar pattern of improvement was reflected in further examination of group mean difference scores. Data from month one to month three (see Table 87) showed greater rate increases for experimental subjects (HE, 28.71; LE, 8.88) than for control subjects (HC, 22.99; LC, -5.95), and

greater rate increases for high ability subjects (HE, 28.71; HC, 22.99) than for low ability subjects (LE, 8.88; LC, -5.95). Data from month one to month four (see Table 88) also showed greater rate improvement for experimental subjects (HE, 15.12; LE, 9.05) than for control subjects (HC, 11.79; LC, -13.22), and greater rate improvement for high ability subjects (HE, 15.12; HC, 11.79) than for low ability subjects (LE, 9.05; LC, -13.22).

The findings presented in this section offer conflicting evidence concerning relative effects of experimental factors on improvement in oral reading fluency. Apart from the effect of reading ability, the repeated reading practice factor appeared to influence improvement on results of the Gray Oral Reading Tests, and on rate results of monthly oral reading samples on supplementary material. No significant effect of repeated reading practice, however, was detected for rate improvement on basal material. Measurement of reading fluency in the Gray is based upon both speed and accuracy. While rate must certainly be considered as a component of fluency, speed alone without accuracy does not result in fluent reading.

In view of the aforementioned findings, therefore, the following null hypothesis is rejected:

First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in oral reading fluency over that of similar students who do not receive supplemental

repeated reading practice.

Hypothesis 7

In order to assess relative similarities among reading patterns of low ability subjects who received the experimental treatment and high ability subjects who did not receive the treatment, t tests of difference between means were applied to all of the dependent variables considered under hypotheses 1-6 for both groups. Comparisons were made for basal and supplementary materials for the duration of the study. The dependent variables were: 1) change from pre-test to post-test on the Johnson Basic Sight Vocabulary Test in number of words correctly identified; 2) change in number of total errors on monthly samples; 3) change in graphic similarity score on monthly samples; 4) change in graphic similarity score of contextually acceptable substitution errors on monthly samples; 5) change in proportion of contextually acceptable substitution errors to total substitution errors on monthly samples; 6) change in proportion of contextually acceptable substitution errors to total errors on monthly samples; 7) change in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors; 8) change in grade equivalent score from pre-test to post-test on the Gray Oral Reading Tests; and 9) change in number of words read per minute on monthly samples.

Change from pre-test to post-test on the Johnson Basic Sight Vocabulary Test in number of words correctly identified

Results of the t test of difference between means are presented in Table 92.

TABLE 92 -- T test of difference between changes from pre-test to post-test on the Johnson Basic Sight Vocabularly Test in number of words correctly identified for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	22.23	16.45	16.9[a]	2.6339	p<.0175*
HC	9.00	7.57			

* Significant [a] Unequal variances

Results of the t-test (see Table 92) indicated a significant difference (t = 2.6339; p<.0175) in favor of low experimental subjects (Mean = 22.23) in increase from pre-test to post-test on the Johnson of words correctly identified.

Change in number of total errors on monthly samples

Results of the t test of difference between means on basal material are presented in Table 93, and on supplementary material in Table 94.

TABLE 93 -- T test of difference between changes in total errors from month one to month four on basal material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	-3.46	53.20	12.4[a]	0.2277	p<.8236
HC	-6.85	6.49			

[a] Unequal variances

TABLE 94 -- T test of difference between changes in total errors from month one to month four on supplementary material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	-27.00	39.09	13.8[a]	-1.7392	p<.1043
HC	-7.46	10.63			

[a] Unequal variances

Results of t tests (see Tables 93 and 94) indicated no significant differences between decreases in total errors over the course of the study for low experimental and high control groups on either basal or supplementary materials.

Change in graphic similarity score on monthly samples

Results of the t test of difference between means on basal material are presented in Table 95, and on supplementary material in Table 96.

TABLE 95 -- T test of difference between changes in graphic similarity score from month one to month four on basal material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	12.92	65.23	16.7[a]	0.7011	p<.4929
HC	-17.99	144.96			

[a] Unequal variances

TABLE 96 -- T test of difference between changes in graphic similarity score from month one to month four on supplementary material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	-14.02	66.18	24.0	-0.3083	p<.7605
HC	-5.06	81.25			

Results of t tests (see Tables 95 and 96) showed no significant differences between changes in graphic similarity score over the course of the study for low experimental and high control groups on either basal or supplementary materials.

Change in graphic similarity score of contextually acceptable substitution errors on monthly samples

Results of the t test of difference between means on basal material are presented in Table 97, and on supplementary material in Table 98.

TABLE 97 -- T test of difference between changes in graphic similarity score of contextually acceptable substitution errors from month one to month four on basal material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	-48.12	131.74	24.0	0.6872	p<.4985
HC	-84.53	138.33			

TABLE 98 -- T test of difference between changes in graphic similarity score of contextually acceptable substitution errors from month one to month four on supplementary material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	-60.17	88.20	18.7[a]	-2.2625	p<.0358*
HC	54.46	159.99			

* Significant

[a] Unequal variances

Results of the t test concerned with basal material (see Table 97) showed no significant difference between decreases in graphic similarity score of contextually acceptable substitution errors over the course of the study for low experimental and high control groups. The t test concerned with supplementary material (see Table 98), however, indicated a significant difference ($t = 2.2625$; $p<.0358$) in the dependent variable for the two groups. The direction of change was negative for the low experimental group (Mean

= -60.17), and positive for the high control group (Mean = 54.46).

Change in proportion of contextually acceptable substitution errors to total substitution errors on monthly samples

Results of the t test of difference between means on basal material are presented in Table 99, and on supplementary material in Table 100.

TABLE 99 -- T test of difference between changes in proportion of contextually acceptable substitution errors to total substitution errors from month one to month four on basal material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	0.00	0.07	12.8[a]	2.6807	p<.0191*
HC	-0.28	0.36			

* Significant

[a] Unequal variances

TABLE 100 -- T test of difference between changes in proportion of contextually acceptable substitution errors to total substitution errors from month one to month four on supplementary material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	0.01	0.08	14.8[a]	0.4725	p<.6435
HC	-0.02	0.23			

[a] Unequal variances

Results of the t test concerned with basal material (see Table 99) showed a significant difference ($t = 2.6807$; $p<.0191$) between change in proportion of contextually acceptable substitution errors to total substitution errors over the course of the study for low experimental and high control groups. The low experimental group experienced no change (Mean = 0.00), while the high control group experienced a decrease in proportion (M = -0.28). The t test concerned with supplementary material (see Table 100), indicated no significant difference in the dependent variable for the two groups.

Change in proportion of contextually acceptable substitution errors to total errors on monthly samples

Results of the t test of difference between means on basal material are presented in Table 101, and on supplementary material in Table 102.

TABLE 101 -- T test of difference between changes in proportion of contextually acceptable substitution errors to total errors from month one to month four on basal material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	0.01	0.05	12.6[a]	2.7989	p<.0155*
HC	-0.23	0.31			

* Significant

[a] Unequal variances

TABLE 102 -- T test of difference between changes in proportion of contextually acceptable substitution errors to total errors from month one to month four on supplementary material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	0.00	0.04	13.2[a]	0.9194	p<.3744
HC	-0.04	0.17			

[a] Unequal Variances

Results of the t test concerned with basal material (see Table 101) indicated a significant difference (t = 2.7989; p<.0155) between change in proportion of contextually acceptable substitution errors to total errors over the course of the study for low experimental and high control groups. The low experimental group had a slight increase in proportion (Mean = 0.01), while the high control group had a large decrease (M = -0.23). The t test concerned with supplementary material (see Table 102), showed no significant difference in the dependent variable for the two groups.

Change in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors on monthly samples

Results of the t test of difference between means on basal material are presented in Table 103, and on supplementary material in Table 104.

TABLE 103 -- T test of difference between changes in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors from month one to month four on basal material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	0.05	0.21	24.0	-1.1402	p<.2654
HC	0.18	0.35			

TABLE 104 -- T test of difference between changes in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors from month one to month four on supplementary material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	0.00	0.06	24.0	0.4347	p<.6676
HC	-0.01	0.10			

Results of t tests (see Tables 103 and 104) indicated no significant differences between changes in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors over the course of the study for low experimental and high control groups on either basal or supplementary materials.

Change in grade equivalent score from pre-test to post-test on the Gray Oral Reading Tests

Results of the t test of difference between means are

presented in Table 105.

TABLE 105 -- T test of difference between changes in grade equivalent score from pre-test to post-test on the Gray Oral Reading Tests for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	0.4	0.3	24.0	-0.4925	p<.6268
HC	0.4	0.4			

Results of the t test (see Table 105) indicated no significant difference between changes in grade equivalent score from pre-test to post-test on the Gray Oral Reading Tests for low experimental and high control groups.

Change in number of words read per minute on monthly samples

Results of the t test of difference between means on basal material are presented in Table 106, and on supplementary material in Table 107.

TABLE 106 -- T test of difference between changes in number of words read per minute from month one to month four on basal material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	20.70	18.56	18.2[a]	-0.6348	p<.5355
HC	27.68	35.02			

[a] Unequal variances

TABLE 107 -- T test of difference between changes in number of words read per minute from month one to month four on supplementary material for low experimental and high control groups.

Group	Mean	Standard Deviation	df	t	Level of Significance
LE	9.05	16.78	24.0	-0.4365	p<.6664
HC	11.79	15.16			

Results of the t tests (see Tables 106 and 107) showed no significant differences between changes in number of words read per minute over the course of the study for low experimental and high control groups on either basal or supplementary materials.

To summarize results of t tests of difference between changes in dependent variables for low ability experimental and high ability control groups considered under the seventh hypothesis, the following summary table is presented.

TABLE 108 -- Summary of results of t tests of difference between changes in nine dependent variables considered under Hypothesis 7 for low ability experimental and high ability control groups.

Dependent Variable	Hypothesized Direction of Change	Significance of Difference between Groups	Explanation of Observed Difference
1	+	Yes (p<.0175)	LE, +
2	-	No	
3	+	No	
4	+	Yes (s)(p<.0358)	LE, - HC, +
5	+	Yes (b)(p<.0191)	LE, no change HC, -
6	+	Yes (b)(p<.0155)	LE, + HC, -
7	+	No	
8	+	No	
9	+	No	

+ = Increase
- = Decrease
b = Basal Material
s = Supplementary Material

In view of the findings presented in this section and summarized in Table 108, the following hypothesis was rejected:

Less able first grade readers whose regular reading instruction is supplemented with repeated reading practice will show significantly less improvement than will more able first grade readers who do not receive supplemental repeated reading practice, in a) increase in sight vocabulary growth; b) decrease in number of oral reading errors

in connected discourse; c) increase in graphic similarity of oral reading errors to text words; d) increase in proportion of oral reading errors with both graphic similarity to text words and contextual acceptability; e) increase in proportion of contextually unacceptable oral reading errors which are self-corrected; and f) increase in oral reading fluency.

Summary

The following hypotheses were accepted, in view of the findings of this study:

(1) First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in sight vocabulary growth over that of similar students who do not receive supplemental repeated reading practice.

(2) First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant decrease in number of oral reading errors in connected discourse over that of similar students who do not receive supplemental repeated reading practice.

(3) First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in graphic similarity of oral reading errors to text words in connected discourse over that of similar students who do not receive supplemental repeated reading practice.

(4) First grade students whose regular reading in-

struction is supplemented with repeated reading practice will show no significant increase in proportion of oral reading errors with both graphic similarity to text words and contextual acceptability over that of similar students who do not receive supplemental repeated reading practice.

(5) First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in proportion of contextually unacceptable oral reading errors which are self-corrected over that of similar students who do not receive supplemental repeated reading practice.

The following hypotheses were rejected, in view of the findings of this study:

(6) First grade students whose regular reading instruction is supplemented with repeated reading practice will show no significant increase in oral reading fluency over that of similar students who do not receive supplemental repeated reading practice.

(7) Less able first grade students whose regular reading instruction is supplemented with repeated reading practice will show significantly less improvement than will more able first grade readers who do not receive supplemental repeated reading practice, in a) increase in sight vocabulary growth; b) decrease in number of oral reading errors in connected discourse; c) increase in graphic similarity of oral reading errors to text words; d) increase in proportion of oral reading errors with both graphic simi-

larity to text words and contextual acceptability; e) increase in proportion of contextually unacceptable oral reading errors which are self-corrected; and f) increase in oral reading fluency.

CHAPTER V

DISCUSSION

Learning to read requires, among other factors, that children become aware of the availablility of informational cues from several sources. In addition, children must learn to use these cues selectively, integrating the information in balanced manner, to achieve fluent and meaningful reading. It is the integration of information, specifically graphic and contextual information, which ultimately characterizes mature reading.[1] Evidence from the literature and in particular form studies of oral reading error patterns indicates, however, that first grade students experience considerable difficulty with integration of graphic and contextual information. The duration and magnitude of this difficulty, according to the literature, appears to be greater for less able first grade students than for more able students.

Preoccupation with one source of information to the exclusion of other information precludes fluent reading. The literature suggests that first grade students, in the

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[1] E. B. Ryan and M. I. Semmell, "Reading as a Constructive Language Process," Reading Research Quarterly, V (1969): 59-83.

early stages of learning to read, rely principally upon either graphic cues or syntactic and semantic cues, but do not readily coordinate information from these sources. Coordination of information gradually results from continued experience with reading of connected discourse. The coordination process is facilitated by reduction in proportion of word recognition errors, which results in increased access to cues available from contextual information. Traditional reading instruction alone, however, regardless of initial emphasis, does not appear to provide means of practice in reading of connected discourse which serves expeditiously to sufficiently reduce the proportion of word recognition errors for many students.

The method of repeated reading practice appeared to provide a means for reading of connected discourse, whereby the reader would be permitted increased access to contextual cues through assistance with word recognition efforts. The method required that a student reread text passages until he was able to read the passages orally with fluency. The literature concerning repeated reading suggests that the method facilitates integration of graphic and contextual information.

This study was designed to investigate the effects on reading patterns of first grade students, when regular reading instruction was supplemented with repeated reading practice.

Review and Interpretation of Findings

To test the hypotheses of this study, experimental and control groups were compared with respect to changes in oral reading skill and error patterns at designated points during and following experimental treatment. The principal statistical means of comparison was 2 X 2 analysis of variance. Two independent variables were considered, each with two levels: 1) repeated reading practice (received, E; not received, C); and 2) reading ability (high, H; low, L). A review of the findings and interpretation of findings concerning each hypothesis are presented below.

Hypothesis 1

Since increased attention to graphic detail appears to facilitate the child's efforts to distinguish among words,[2] this study attempted to determine whether repeated reading practice promoted increased attention to intra-word detail. Sight vocabulary growth, as measured in this study, was viewed as indication of increased attention to letters within words. The measurement instrument, the Johnson Basic Sight Vocabulary Test, permitted pure measure of attention to graphic detail since test words were not presented in connected discourse. The subject was required to select from a row of words similar in appearance a stimulus word spoken by the test administrator.

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[2] W. E. Jeffrey and S. Jay Samuels, "Effect of Method of Reading Training on Initial Learning and Transfer," Journal of Verbal Learning and Verbal Behavior, VI (1967): 354-358.

The test words from the Johnson were not taught nor specifically emphasized during the study, so sight vocabulary growth would indicate transfer of skill as well as increased attention to graphic detail. Another investigator reported that repeated reading practice had significant effect on second grade subjects' ability to read individual words which were not previously taught.[3]

In the present study, however, no significant effect for repeated reading practice was indicated. The reading ability factor did have a significant effect, with low ability subjects showing nearly double the sight vocabulary growth shown by high ability subjects. This apparent effect appears to be related to the regression toward the mean phenomenon. An analysis of variance on results of the Johnson pre-test indicated that high ability subjects scored significantly higher ($F = 48.18$; $p<.0001$) than low ability subjects.

Although test words from the Johnson were not specifically emphasized under the experimental treatment, these words are among those most commonly used in first grade reading materials. It is not unlikely that many of the words were emphasized during regular reading instruction. This may serve to explain the sight vocabulary growth experienced by all groups in the study. Perhaps a test in-

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[3] Patricia J. R. Dahl, "An Experimental Program for Teaching High Speed Word Recognition and Comprehension Skills," Final Report (Bloomington Public Schools, Minnesota), National Institute of Education, Washington, D.C. (1974).

strument which used words of progressive difficulty, such as the reading subtest of the Wide Range Achievement Test, would have permitted better evaluation of sight vocabulary growth.

Hypothesis 2

Previous investigators have concluded that proportion of reading errors in connected discourse, and the inverse proportion of words read correctly, are directly related to accessibility of contextual information for the reader. As the child's ability to recognize words improves, an increasing proportion of text remains intact, permitting the child to draw from syntactic and semantic cues for further word recognition and comprehension efforts.[4] Decrease in proportion of reading errors also reflects increased awareness of and attention to graphic relationships,[5] which should assist the child in identification of unfamiliar words.

Other researchers have reported that repeated reading practice influenced reduction of oral reading errors.[6] In

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[4] Marie M. Clay, "Reading Errors and Self-Correction Behavior," British Journal of Educational Psychology, XXXIX (1969): 47-56; and Rose-Marie Weber, "A Linguistic Analysis of First Grade Errors," Reading Research Quarterly, V (1970): 428-451.

[5] Alice S. Cohen, "Oral Reading Errors of First Grade Children Taught a Code Emphasis Approach," Reading Research Quarterly, X (1975): 616-650.

[6] Dahl, p. 84; and Kenneth Hoskisson, Thomas Sherman, and Linda F. Smith, "Assisted Reading and Parent Involvement," The Reading Teacher, XXVII (1974): 710-714.

the present study, no significant effect of repeated reading practice on decrease in total errors was found, either on basal or supplementary material. The reading ability factor had one significant short-term effect, from month one to month two on basal material, when low group subjects experienced a large increase in total errors. Although all groups showed decrease in total errors over the course of the study, the low ability control subjects showed the largest decrease on both basal and supplementary presentations.

Hypothesis 3

Prior research supports the contention that transferance of word recognition skill is enhanced when the child begins to increase attention to intra-word graphic detail.[7] Graphic similarity of errors to text words has been examined as a measure of such attention in several oral reading studies. These studies indicate that better first grade readers substitute words highly similar in appearance to text words earlier in the learning process and more frequently than do poorer readers.[8]

Since other research with repeated reading practice has reported significant effects on recognition of pre-

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[7] Jeffrey and Samuels, pp. 354-358.

[8] Clay, pp. 47-56; Weber, pp. 428-451; Cohen, pp. 616-650; and A. J. Biemiller, "The Development of the Use of Graphic and Contextual Information as Children Learn to Read," Reading Research Quarterly, VI (1970): 75-96.

viously untaught words,[9] and on decrease in oral reading errors,[10] both of which factors reflect increased attention to graphic cues, this investigator hypothesized that repeated reading practice would also influence graphic similarity of errors to text words. A graphic similarity index developed by Weber[11] was used to assess the extent to which substitution errors approximated text words in terms of letters.

No significant effects were found for repeated reading practice on change in graphic similarity score, on either basal or supplementary material. The effect of the repeated reading practice factor approached significance, however, from month one to month four on basal material. Graphic similarity score over the four month period on basal material increased for experimental subjects and decreased for control subjects. In contrast, all groups experienced decreased graphic similarity scores on supplementary material. By the conclusion of the study, experimental subjects appear to have been attending to graphic cues somewhat more closely than control subjects on basal material. On supplementary material, which consisted of a greater variety of words and perhaps a greater proportion of unfamiliar words than basal material, graphic cues were

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[9] Dahl, pp. 78-79.

[10] Dahl, p. 79; and Hoskisson, Sherman, and Smith, pp. 710-714.

[11] Weber, pp. 429-451.

apparently less salient for the first grade readers.

A significant effect was detected for reading ability from month one to month two on basal material. In this time period, high ability subjects experienced increase in graphic similarity score nearly five times as large as that shown by low ability subjects. This pattern changed dramatically throughout the study, although high ability experimental subjects experienced the greatest net increase for the entire four month investigation.

Hypothesis 4

Reading of connected discourse requires not only awareness of and attention to graphic information, but also integration of this information with syntactic and semantic cues. The literature suggests that it is with this integration process that first grade readers experience considerable difficulty. Ability to coordinate graphic and contextual information is apparently acquired only very gradually, even for more able readers. For less able readers, acquisition of this ability is laborious.[12]

Previous research has found that repeated reading practice favorably affects integration of graphic and contextual information.[13] The present study examined the

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[12] Clay, pp. 47-56; Weber, pp. 428-451; and Biemiller, pp. 75-96.

[13] Dahl, p. 80; Hoskisson, Sherman, and Smith; and Bonnie Lee Miller, "Assisted Reading as a Remedial Reading Technique at the High school Level: A Psycholinguistic Evaluation," (Ph.D. dissertation, Virginia Polytechnic and State University, 1977).

effect of repeated reading on changes in 1) graphic similarity score of contextually acceptable substitution errors; 2) proportion of contextually acceptable substitution errors to total substitution errors; and 3) proportion of contextually acceptable substitution errors to total errors. Considered together, these three variables provided a comprehensive representation of change in both graphic similarity and contextual acceptability.

Two instances of significant effect for the reading ability factor were indicated concerning change in graphic siilarity score of contextually acceptable substitution errors. One of these was a short term effect, from month one to month two on basal material. During this period of the study, high ability subjects experienced large increases in graphic similarity score relative to decreases experienced by low ability subjects. A similar effect was found over the course of the study, from month one to month four, on supplementary material. High ability subjects showed large increases in graphic similarity score, whereas low ability subjects showed decreases. Although no other significant effects were found, on basal material over the entire term of the study graphic similarity of contextually acceptable substitution errors declined for all groups. For high ability experimental subjects the decline was slight, relative to decreases exhibited by all other groups.

The second dependent variable considered was change

in proportion of contextually acceptable substitution errors to total substitution errors. Significant main effects were indicated for both repeated reading practice and reading ability on this variable from month one to month four on basal material. Experimental subjects experienced a smaller decrease in the dependent variable over the course of the study than did control subjects. In addition, the decline exhibited by high ability subjects was greater than that exhibited by low ability subjects. When the four groups were considered individually, the low ability experimental group showed no change in the dependent variable; whereas, all other groups exhibited decline.

On supplementary material, one significant short term interactive effect was observed on change in proportion of contextually acceptable substitution errors to total substitution errors. From month one to month two, low ability experimental subjects and high ability control subjects showed greater increases in the dependent variable than did other subjects. At the conclusion of the study, only low ability experimental subjects showed an increase in the dependent variable; whereas, all other groups exhibited decline. None of these differences, however, from month one to month four, were considered as significant.

The third dependent variable considered under the fourth hypothesis was change in proportion of contextually acceptable substitution errors to total errors. On basal material from month one to month four, the effects of both

repeated reading practice and reading ability were found to be significant, as was the interaction of the two factors. Main effects, in this instance, must be viewed in light of the significant interaction. Of the four groups, the low ability experimental group was alone in exhibiting a slight increase in the dependent variable. The high ability control group showed a large decrease relative to the other groups.

On supplementary material, no significant effects were observed on change in proportion of contextually acceptable substitution errors to total errors. From month one to month four, however, low ability subjects showed no change in the dependent variable; whereas, high ability subjects showed slight decline.

For purposes of interpretation, the three dependent variables studied under hypothesis four must be considered together. The investigator hypothesized that repeated reading practice may favorably influence the ability of first grade readers to integrate graphic and contextual information. If this were in fact true, results of the study should provide answers to two interrelated questions. First, could increase be observed for experimental subjects in proportion of contextually acceptable substitution errors to total substitution errors and/or to total errors of all types? An affirmative answer to this question would reflect improvement in use of contextual cues. Second, would experimental subjects show increase in graphic simi-

larity of contextually acceptable errors to text words? A positive response to the second question would indicate increased attention to graphic detail and greater reliance upon graphic information for word recognition. Only in the event that both questions were answered affirmatively could it be concluded that repeated reading practice favorably influenced integration of graphic and contextual information.

On basal material, low ability experimental subjects exhibited no appreciable change in proportion of contextually acceptable substitution errors to total substitution errors, and slight increase in proportion to total errors of all types. The proportion of contextually acceptable substitution errors declined for all other gruops, with the most dramatic decline exhibited by the high ability control group. Similar patterns were observed for all groups on supplementary material, although results were not statistically significant. These results suggest that low ability experimental subjects continued to use contextual information for word recogntion efforts throughout the study. The salience of contextual cues for other groups, however, appeared to diminish. For none of the groups did proportion of contextually acceptable substitution errors increase dramatically. High ability control subjects did, however, exhibit a dramatic decrease on basal material.

Graphic similarity of contextually acceptable substitution errors decreased for all groups from month one to

month four on basal material, although no significant differences were observed among groups. During the same period on supplementary material, high ability subjects experienced significant increase in graphic similarity score while low ability subjects experienced significant decrease. These results appear to indicate that when substitution errors on basal material were contextually acceptable, the errors were unlikely to be graphically similar to text words. Weber concluded on the basis of similar results that first grade readers experience difficulty in attending simultaneously to both graphic and contextual constraints.[14] On supplementary material, however, for high ability subjects contextually acceptable substitution errors were also likely to be graphically constrained. These differences for basal and supplementary presentations may be related to differences in the materials themselves. Basal material is more highly constrained with respect to both vocabulary and syntax than the trade book material used for supplementary presentations. High ability readers may have found contextual information sufficient for producing meaningful discourse on basal presentations. On supplementary material, in which word and structure possibilities were more varied, the high ability subjects may have found it necessary to attend more closely to both graphic and contextual constraints in attempting to produce meaningful discourse. The better readers then may have

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[14] Weber, pp. 428-451.

been exhibiting differences in strategy depending upon nature of the material. Schwartz observed that for more able first grade readers, attention to graphic detail became an integral component of a decoding strategy already subordinate to comprehension.[15] Results of the present study suggest further that the strategy may be differentially applied according to the nature and difficulty of the reading material.

In conclusion, repeated reading practice did not appear to favorably affect integration of graphic and contextual information for first grade readers in this study. Although proportion of contextually acceptable substitutions did not decline for low ability experimental subjects, neither did this proportion substantially increase. For other groups, including high ability experimental subjects, proportion of contextually acceptable substitution errors decreased during the study. Graphic similarity of contextually acceptable substitutions increased only for high ability subjects, and only on supplementary material. Repeated reading practice may indeed have promoted reliance upon contextual cues for low ability experimental subjects, a pattern which Biemiller believed serves to inhibit increased attention to graphic information.[16]

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[15] Robert M. Schwartz, "Strategic Processes in Beginning Reading," Technical Report Number 15 (Bolt, Beranek, and Newman, Inc., Cambridge, Massachusetts; Illinois University, Urbana), Center for the Study of Reading (1976).

[16] Biemiller, pp.75-96.

Hypothesis 5

According to results of several oral reading studies, self-correction of errors characterizes the reading of students who are attending to syntactic and semantic information.[17] While both more able and less able first grade readers appear to improve self-correction behavior, more able readers exhibit substantially greater improvement.[18] Weber reported that the better readers in her study corrected a greater percentage of contextually unacceptable errors than did poorer readers.[19]

Self-correction behavior is also related to error rate and word recognition accuracy. When errors are surrounded by a large proportion of correct responses, the reader can draw from the strong contextual background for error correction. When errors occur frequently, on the other hand, accessibilty of contextual information for error correction diminishes.[20]

Previous research indicates that repeated reading helps to reduce error rate,[21] as well as to improve self-correction behavior.[22] The present study examined changes

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[17] Weber, pp. 428-451; and Clay, pp. 47-56.

[18] Weber, pp. 428-451; Clay, pp. 47-56; and Cohen, pp. 616-650.

[19] Weber, pp. 428-451.

[20] Clay, pp. 47-56.

[21] Dahl, p. 79; and Hoskisson, Sherman and Smith, pp. 710-714.

[22] Hoskisson, Sherman, and Smith, pp. 710-714.

in self-correction of contextually unacceptable oral reading errors.

No significant effects were observed for repeated reading practice or for reading ability, on either basal or supplementary presentations. Self-correction of contextually unacceptable errors on basal material did improve during the study, slightly more for high ability subjects than low-ability subjects. On supplementary material, self-correction remained relatively stable for all groups except the low ability control group, which experienced substantial decline. In view of the finding under hypothesis one of this study, reported earlier, that repeated reading practice failed to have a significant effect on differences in decrease in total errors, the results concerning change in self-correction are not surprising. As Clay concluded, increasing proportions of correctly identified words permit the reader to monitor context for assistance with correction when errors do occur.[23] The results of this study concerning self-correction behavior, with repeated reading practice as an experimental factor, appear to mirror the results of Weber's[24] investigation, in which no extraordinary intervention was introduced. In both cases, the better readers corrected a greater percentage of contextually unacceptable errors than did less able readers.

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[23] Clay, pp. 47-56.

[24] Weber, pp. 428-451.

Hypothesis 6

Fluent reading is characterized by rate appropriate to difficulty level of the reading material, as well as by minimal word recognition errors. Fluency in reading then reflects facility with printed language just as fluency in speech reflects facility with oral language. Samuels proposed that the fluent reader decodes text automatically, without attention, while directing attention to comprehension.[25]

Fluency improvement should result from improvement in word recognition skill. Instructional emphasis upon rate should produce further improvement in reading fluency. The literature concerned with repeated reading indicates that the method enhances fluency in terms of both improved word recognition accuracy and improved rate.[26]

In the present study, experimental subjects received repeated reading practice by reading stories along with taped versions of the stories. Each subject practiced reading his story until he could read it orally at a rate of one hundred words per minute, without access to the taped rendition. During practice sessions, the taped version of the story permitted ready access to word recognition assistance. As a consequence of the format in which repeated reading practice was presented, both word recogni-

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[25] S. Jay Samuels, "The Method of Repeated Readings," The Reading Teacher, XXXII (1979): 403-408.

[26] Samuels, pp. 403-408; Dahl; Hoskisson, Sherman, and Smith, pp. 710-714; and Carol Chomsky, "After Decoding: What?" Language Arts, LIII (1976): 288-296, 314.

tion accuracy and rate received instructional emphasis.

Two measures of fluency change were employed. The first measure was change from pre-test to post-test in results of the Gray Oral Reading Tests. Results of the Gray, expressed as grade equivalent scores, are based upon the extent to which subjects can read progressively difficult passages with both accuracy and speed. Change in grade equivalent scores from pre-test to post-test was analyzed with 2 X 2 analysis of variance. The second measure was change in reading rate, expressed as number of words read per minute, on monthly reading samples from month one to subsequent months. This change was also examined with 2 X 2 analysis of variance.

Significant main effects were observed for both repeated reading practice and reading ability on change from Gray pre-test to post-test. Experimental subjects experienced greater gain than did control subjects, and high ability subjects improved more than did low ability subjects. High ability experimental subjects displayed the greatest improvement, a gain of seven months over the four month study. Low ability subjects who received repeated reading practice exhibited an increase of four months, equal to the gain experienced by high ability subjects who did not receive the treatment. This finding is of particular importance, considering that a four month gain in a period of four months would be expected of average students under normal conditions. Low ability control group sub-

jects experienced a gain of two months.

On basal material, one significant short term effect was observed for the reading ability factor on change in reading rate. From month one to month three, high ability subjects exhibited a large increase in number of words read per minute relative to that experienced by low ability subjects. All groups exhibited increase in reading rate over the course of the study.

On supplementary material, significant main effects were observed for both repeated reading practice and reading ability on change in reading rate for all three measurement periods of the study. This was the only instance, in fact, where significant effects observed early in the study remained consistent to the conclusion of the investigation. For all three time periods considered, experimental subjects experienced greater increase in number of words read per minute than did control subjects. In addition, high ability subjects showed a greater rate improvement than did low ability subjects. Low ability control subjects experienced rate decline for all three periods, while all other groups experienced rate increase.

As reported earlier, low ability control subjects also experienced the greatest decline in total errors on supplementary material over the course of the study. In absence of instructional emphasis on rate, perhaps these subjects were attending more to word recognition accuracy at the expense of speed. Although this same group also

exhibited the greatest decrease in total errors on basal material, while increasing rate, familiarity with the vocabulary and syntax of the basal material probably facilitated rate improvement. High ability control subjects also received no instructional emphasis on reading rate. This group displayed rate increase on both basal and supplementary presentations, and likewise exhibited decrease in total errors. These high ability subjects most likely did not experience a trade-off between accuracy and speed because they made many fewer errors during the study than did their low ability counterparts. Experimental subjects, who received instructional emphasis on rate through repeated reading practice, exhibited increase in rate and decrease in errors on both basal and supplementary materials.

These results from the Gray and monthly oral reading samples support the conclusion that repeated reading practice contributed to improvement in reading fluency for subjects in this study. Furthermore, differences in favor of experimental subjects appear to reflect the combined emphasis on word recognition accuracy and reading rate which characterizes the repeated reading method.

Hypothesis 7

Prior research concerned with oral reading behavior of beginning readers confirms that differences in reading strategies between more able and less able students can be

observed during first grade.[27] More able readers in these studies displayed substantially more improvement in attending to graphic detail and in coordinating graphic and contextual information throughout first grade than did less able readers. These differential patterns became apparent to investigators through analysis of oral reading errors, which permitted examination of the manner in which subjects attempted to translate from print to speech.

Several studies which employed repeated reading as an intervention with students who were experiencing reading difficulty reported evidence of subjects' improved attention to graphic detail as well as integration of contextual and graphic cues.[28] It was hypothesized in the present investigation that reading strategies of low ability subjects who received repeated reading practice would be similar to strategies of high ability subjects who did not receive the treatment. To determine relative similarity of reading strategies, it was necessary to examine the extent and direction of differences between changes of both groups on all dependent variables considered under hypotheses one through six.

T tests of difference between means were applied to changes in the dependent variables for low ability experimental subjects and high ability control subjects. Compar-

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[27] Clay, pp. 47-56; Weber, pp. 428-451; Biemiller, pp. 75-96; and Cohen, pp. 616-650.

[28] Samuels, pp. 403-408; Hoskisson, Sherman, and Smith, pp. 710-714; Dahl, p. 80; and Chomsky, pp. 288-296, 314.

isons concerning error patterns on monthly oral reading samples focused upon only those changes which occurred from month one to month four. The dependent variables were: 1) change from pre-test to post-test on the Johnson Basic Sight Vocabulary Test in number of words correctly identified; 2) change in number of total errors on monthly samples; 3) change in graphic similarity score on monthly samples; 4) change in graphic similarity score of contextually acceptable substitution errors on monthly samples; 5) change in proportion of contextually acceptable substitution errors to total substitution errors on monthly samples; 6) change in proportion of contextually acceptable substitution errors to total errors on monthly samples; 7) change in proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors; 8) change in grade equivalent score from pre-test to post-test on the Gray Oral Reading Tests; and 9) change in number of words read per minute on monthly samples.

While not included in the t test analyses, it was necessary to consider for purposes of interpretation any observed similarities among strategies of high ability control subjects, low ability control subjects, and low ability experimental subjects. Otherwise, relative strategy similarities may have been falsely attributed to the influence of repeated reading practice.

A significant difference was observed between changes from pre-test to post-test on results of the Johnson for

low experimental and high control groups. Low ability experimental subjects experienced a mean increase of twenty-two words correctly identified; whereas high ability control subjects showed a mean increase of nine words. This difference, as was explained earlier, can likely be attributed to regression toward the mean, since high ability control subjects scored significantly higher on the pre-test than did low ability experimental subjects. In addition, low ability control subjects also exhibited a mean increase of twenty-two words correctly identified. Similarity in the extent and direction of sight vocabulary change, therefore, cannot be attributed to the effect of repeated reading practice.

No significant differences were observed between mean changes in total errors on basal and supplementary materials for high ability control subjects and low ability experimental subjects. Both groups experienced decrease in total errors on both presentations. Low ability control subjects, however, exhibited the largest mean decrease in total errors on both presentations among the three groups.

No significant differences were found between mean changes in graphic similarity score of substitution errors on basal and supplementary materials for high ability control and low ability experimental groups. Low ability experimental subjects exhibited increase in graphic similarity on basal presentations, and decrease on supplementary presentations. High ability control subjects experienced

decrease in graphic similarity on both presentations. Low ability control subjects also showed decrease in graphic similarity on both basal and supplementary materials. While similarity between high ability control subjects and low ability experimental subjects in extent of graphic similarity change may not be attributable to repeated reading practice, difference between the groups in direction of change probably can be attributed to the influence of the treatment. At the conclusion of the study, low ability experimental subjects appeared to be increasing attention to graphic detail -- a pattern characteristic of better first grade readers observed in other research.

On basal material, no significant difference was observed between changes in graphic similarity of contextually acceptable substitution errors for high ability control subjects and low ability experimental subjects. Both groups experienced decrease in graphic similarity of contextually acceptable substitution errors. On supplementary material, for which a significant difference was observed, high ability control subjects exhibited increase in graphic similarity while low ability experimental subjects experienced decrease. On both presentations, low ability control subjects exhibited decrease in graphic similarity score of contextually acceptable substitution errors approximately equal in magnitude to that displayed by low ability experimental subjects. Repeated reading practice apparently was not responsible for any strategy similarity between high

control and low experimental groups.

A significant difference was detected on basal material between changes in proportion of contextually acceptable substitution errors to total substitution errors for high control subjects and low experimental subjects. The low ability experimental group experienced no appreciable change; whereas the high ability control group exhibited decrease in proportion of twenty-eight percentage points. On supplementary material, for which no significant difference was found, low experimental subjects showed a slight increase and high control subjects showed a slight decrease in proportion of contextually acceptable substitution errors to total substitution errors. Low ability control subjects experienced slight decreases on both presentations. Repeated reading practice did not appear to affect strategy similarities between high control and low experimental subjects. Contextual cues appeared to remain salient throughout the study, however, for low ability experimental subjects, and appeared to diminish in importance for the other two groups. Better readers in other oral reading studies maintained or increased attention to contextual constraints throughout first grade.

A significant difference was detected on basal material between changes in proportion of contextually acceptable substitution errors to total errors for high control and low experimental groups. Low experimental subjects exhibited a slight increase in proportion; whereas, high

control subjects experienced substantial decline. No significant difference was observed on supplementary material, on which low experimental subjects showed no appreciable change and high control subjects experienced slight decline in proportion. Low ability control subjects experienced slight decline on basal presentations and no appreciable change on supplementary presentations. Repeated reading practice apparently did not influence any reading strategy similarity.

No significant differences were observed on either basal or supplementary material between changes in proportion of contextually unacceptable errors which were self-corrected for low experimental and high control groups. Both groups exhibited increase in proportion on basal material. On supplementary material, high ability control subjects experienced slight decrease in proportion; whereas, low ability experimental subjects experienced no appreciable change. Low ability control subjects exhibited increase in proportion of self-corrected contextually unacceptable errors on basal material, nearly equal in magnitude to increases of the other two groups on basal material. On supplementary material, low control subjects showed substantial decline in proportion, of far greater magnitude than changes exhibited by the other groups. These results suggest that similarities between self-correction patterns of high control and low experimental subjects on supplementary material were influenced by repeated reading prac-

tice. Self-correction of contextually unacceptable errors on supplementary material remained relatively stable for both groups throughout the study.

No significant difference was found between changes in grade equivalent score from pre-test to post-test on the Gray for low experimental and high control groups. Similar results were observed for changes in number of words read per minute on monthly basal and supplementary materials. Both groups exhibited a four month increase from pre-test to post-test on the Gray. The low ability control group, in contrast, experienced a two-month gain. Low experimental and high control subjects exhibited nearly equal increases in reading rate on both basal and supplementary presentations. Low ability control subjects experienced increase in rate on basal material, of less magnitude than increases displayed by the other two groups. On supplementary material, low control subjects experienced substantial decline in number of words read per minute. These results appear to indicate that similarities between reading fluency patterns of high control and low experimental subjects were affected by repeated reading practice.

In summary, repeated reading practice did appear to influence similarity of some reading strategies employed by low ability experimental subjects and high ability control subjects in this study. Changes in self-correction of contextually unacceptable errors on supplementary material were nearly equal for both groups. Of greater importance,

increases in reading fluency reflected in improved word recognition accuracy and reading rate were substantially the same for both groups.

Although other similarities were observed between strategies of the two groups, these similarities applied as well to patterns exhibited by low ability control subjects. Of the three groups, however, the low ability experimental group alone appeared to increase attention to graphic detail on basal material and to maintain attention to contextual cues on basal and supplementary presentations. These patterns have characterized behavior of better readers in other oral reading studies.

Conclusions

This study examined the effects on reading strategies of first grade students, when regular reading instruction was supplemented with repeated reading practice. Strategies related to increased attention to graphic detail were inferred from changes in sight vocabulary growth, number of oral reading errors in connected discourse, and graphic similarity of oral reading errors to text words in connected discourse. On the basis of findings concerning these patterns, the following conclusions were drawn:

1. For subjects in this study, repeated reading practice did not appear to influence sight vocabulary growth or decrease in number of oral reading errors in connected discourse.

2. Repeated reading practice appeared to affect in-

crease in graphic similarity of oral reading errors to text words on basal material.

Strategies related to increased integration of graphic and contextual information were inferred from changes in proportion of oral reading errors with both graphic similarity to text words and contextual acceptability, and proportion of contextually unacceptable oral reading errors which are self-corrected. On the basis of findings concerning these patterns, the following conclusions were drawn:

1. For subjects in this study, repeated reading practice did not appear to influence increase in graphic similarity score of contextually acceptable substitutions.

2. Repeated reading practice appeared to influence change in proportion of contextually acceptable substitutions, and in particular for low ability subjects on basal material.

3. Repeated reading practice did not appear to affect change in self-correction of contextually unacceptable errors.

Strategies related to increased reading fluency were inferred from changes in test results sensitive to both word recognition accuracy and reading rate, and number of words read per minute on monthly oral reading samples. On the basis of findings concerning these patterns, the following conclusions were drawn:

1. For subjects in this study, repeated reading

practice appeared to influence improvement in test results sensitive to both word recognition accuracy and reading rate.

2. Repeated reading practice appeared to influence improvement in reading rate, and in particular on supplementary material.

This study further attempted to determine whether repeated reading practice promoted similarity among reading strategies of low ability and high ability first grade readers. Similarity among strategies was inferred from differences between low ability experimental subjects and high ability control subjects in changes related to all relevant dependent variables. On the basis of findings concerning these differences, the following conclusions were drawn:

1. Repeated reading practice appeared to promote similarity in self-correction of contextually unacceptable errors on supplementary material for low ability and high ability subjects.

2. Repeated reading practice appeared to promote similarity in oral reading fluency for low ability and high ability subjects.

Educational Implications

The findings of this study suggest several implications for first grade reading instruction. In general, evidence from the present investigation supports the conclusion from earlier research that first grade students,

and in particular less able first grade students, experience considerable difficulty learning to coordinate graphic and contextual information.[29] First grade teachers must, first, recognize the importance of this ability; and second, realize that special efforts will be required to promote its acquisition. Repeated reading practice, at least under the conditions employed in this study, is apparently no more or less valuable than other methods for facilitating integration of graphic and contextual information.

Repeated reading practice does appear to have value, however, for promoting attention to graphic detail and for maintaining attention to contextual cues. The method, when used to supplement regular reading instruction, may provide opportunities for first grade readers to develop linguistic identities for many words, a condition considered necessary for expansion of word recognition skill.[30]

Finally, repeated reading practice, which emphasizes both accuracy and rate, has value for promoting reading fluency among first grade students. Traditional first grade reading instruction does not emphasize reading speed. Early oral reading efforts of first graders, and in particular of less able first graders, are often slow and

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[29] Biemiller, pp. 75-96; Weber, pp. 428-451; and Cohen, pp. 616-650.

[30] Linnea C. Ehri, "Beginning Reading from a Psycholinguistic Perspective: Amalgamation of Word Identities," in The Recognition of Words, ed. Frank B. Murray (Newark: International Reading Association, 1978), p. 1-33.

laborious. Speed, however, is an important characteristic of fluent reading.[31] Repeated reading practice, or a similar method, used to supplement regular reading instruction, may provide a means of emphasizing speed in an enjoyable, non-threatening manner, and may thus serve to enhance reading fluency.

Recommendations for Further Research

The following are offered as suggestions for further research concerning acquisition of reading skills and strategies by first grade students:

1. Reexamination of the variables considered in this study, however, with larger samples over the entire first year of instruction.

2. Further study of development of skills and strategies which distinguish more able and less able readers during first grade, and of the manner and sequence in which development occurs.

3. Further investigation of early childhood development patterns and relationships among such patterns to acquisition of reading skills and strategies during first grade.

4. Examination of specific instructional methods or strategies which may promote integration of contextual and graphic information among first grade students.

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[31] Frank Smith, Understanding Reading (New York: Holt, Rinehart, and Winston, 1978), p. 181.

SUMMARY

First grade readers experience considerable difficulty with learning to coordinate information provided by graphic and contextual cues. Traditional reading instruction alone did not appear to facilitate acquisition of this ability for many first graders. This study was designed to examine the effects on first graders' reading strategies when repeated reading practice was used to supplement regular reading instruction.

Analysis of oral reading errors produced by first grade subjects on monthly samples of basal and trade book material focused upon changes in use of graphic information and contextual information. Changes among subjects in sight vocabulary growth and oral reading fluency were also examined. The study further attempted to detect any differential effects of repeated reading practice on reading strategies of more able and less able first grade readers.

Experimental subjects received repeated reading practice for thirty minutes daily throughout the four month study. Subjects read trade book material with the assistance of audio-taped renditions in continuous fashion, until oral reading fluency criteria were achieved.

In order to test the hypotheses of the study, a ran-

domized 2 X 2 factorial design was employed. The first independent variable was repeated reading practice, with two levels: either subjects received this practice or they did not. The second independent variable was reading ability, with two levels: high and low. To determine the effect of repeated reading on sight vocabulary growth, analysis of variance was performed on change in number of words correctly identified from pre-test to post-test on the Johnson Basic Sight Vocabulary Test. To determine the effect of the treatment on oral reading fluency, analysis of variance was performed on change from pre-test to post-test in results of the Gray Oral Reading Tests, and on difference in number of words read per minute from month one to subsequent months on monthly oral reading samples.

In order to examine changes in subjects' use of graphic and contextual information, differences in oral reading error scores from four monthly samples of basal and supplementary material were subjected to analyses of variance. Dependent variables were changes in number of total errors; graphic similarity score; graphic similarity of contextually acceptable substitutions; proportion of contextually acceptable substitutions to total substitutions; proportion of contextually acceptable substitutions to total errors; and proportion of self-corrected contextually unacceptable errors to total contextually unacceptable errors. To assess relative similarities among reading patterns of low ability subjects who received the experimental

treatment and high ability subjects who did not receive the treatment, t tests of difference between means were applied to all of the dependent variables considered in the study for both groups.

Results of analyses of variance indicated that repeated reading practice had significant effects on change in proportion of contextually acceptable substitution errors, and on improvement in oral reading fluency. No other significant long-term effects for repeated reading practice were observed on any of the other dependent variables considered in the study. Results of t tests of difference between means indicated similarity between low ability experimental and high ability control subjects with respect to self-correction of contextually unacceptable errors on supplementary material, and change in oral reading fluency.

The investigator suggests that repeated reading practice may have limited value for promoting integration of graphic and contextual information by first grade students, but potentially greater value for promoting other aspects of reading skill acquisition. Further research is recommended concerning both develoment of reading skills and strategies by first grade students, and the effects of repeated reading practice on such development.

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APPENDIX A

ORAL READING SAMPLE -- MONTH 1, BASAL

POCKETS OF FIGS

A little pig went down the road. It was a bright, summer day. But it was not a happy day for the pig. The poor pig had not had a thing to eat for days. And he was very, very hungry.

The little pig went over to a pond and sat down. He looked into the pond. Then he looked up at the sky.

"I can't go on," said the pig. "I am so hungry. I need to eat."

A fig was in the grass. The pig picked it up and looked at it. Then he looked up at the tree.

"This fig is from this tree," said the little pig. "This is a fig tree! It is filled with big figs. At last, I can eat!"

But the pig did not eat the figs. He jumped and jumped. But he did not get up into the tree. Not a fig did he get.

"Poor me," said the pig. "I can't get up in that tree. And I am so hungry."

Then he went back to the road. "I need help," he said. "I need to get the figs down from the tree."

A monkey came down the road. "Mr. Monkey! Mr. Monkey!" said the pig. "Are you hungry?"

"Yes, I am hungry," said the monkey. "I did not eat lunch."

"Then I can help you," said the pig, "And you can help me."

ORAL READING SAMPLE -- MONTH 1, SUPPLEMENTARY

THE BIG WHITE THING

"Come with me," said Rick Raccoon. "I have found a big white thing under our tree."

Chuck Raccoon went with Rick to see the big white thing.

"Look at it," said Rick Raccoon. "What is it?" asked Chuck.

"It's a white elephant," said Rick. "It has four legs and is very big. It is asleep under our tree."

Chuck went around the big white thing. "It is not an elephant," he said. "It does not have a trunk or tail."

Sally Raccoon climbed down the tree. She looked at the big white thing.

Rick said, "I found the big white thing under our tree. What is it?"

Sally looked at it. "It looks like a boat," she said.

"We can push it to the lake. We can have a boat ride," said Rick.

They pushed and pushed. The big white thing did not move. The raccoons looked at the big white thing. "It's not an elephant. It's not a boat," they said.

It began to rain. The raccoons climbed the tree and went to sleep.

After the rain they climbed down. "Look!" said Chuck Raccoon. "There is water in the big white thing."

Rick Raccoon climbed up and looked in.

"We can play in it," said Sally Raccoon.

"We can wash our food in it," said Chuck.

"I'm glad it's not an elephant," said Rick.

"I'm glad it's not a boat," said Sally.

"I don't know what it is," said Chuck. "But we can have a bath in it."

And they did!

ORAL READING SAMPLE -- MONTH 2, BASAL

THE RAIN MAKER

Pat will never forget that hot summer in the city. No rain came. The sun was bright and hot, day after day after day. It was so hot that dogs just sat. And cats hid in the shadows. It was so hot that boys and girls did not run and play. It was so hot that city people did not sleep.

"I am so hot," said Pat.

"We need rain," said Pat's father.

"Yes, we must get some rain soon," said Pat's mother.

"When will it rain?" asked Pat.

"I can't tell," said his mother. "What we need is a good rain maker."

"What is a rain maker?" asked Pat.

"Something that makes rain," said his mother. "Some people think rain makers are magic. Some people think they can make rain. And some people think they can't."

"Do you think they can?" asked Pat.

"Yes, and no," said his mother.

What his mother said about rain makers made Pat do some thinking. He went over to his friend Bucky's apartment. He had something to ask him.

"Bucky, will you help me build a rain maker?" Pat asked.

"What in the world is a rain maker?" asked Bucky.

So Pat had to tell what his mother had said about rain makers. Then Bucky said, "Yes, Pat. I will help you build a rain maker. But do you think it can bring rain?"

ORAL READING SAMPLE -- MONTH 2, SUPPLEMENTARY

THE SQUIRREL'S TREE PARTY

The squirrels are all asleep

Pitter-patter. Pitter-patter. What is that?

It is rain!

Mother and father are asleep. Come on. We can play in the rain.

Oh what fun to jump and play in the rain!

Oh! Poor Frisky!

Father! Mother! Help, help! Frisky is in a puddle.

Hold on! Hold on, Frisky.

You are wet little squirrels. Little squirrels must not play in the rain.

Come. Sit down. Sit down and eat.

What can we do? What can we play on a rainy day?

You can bake a cake on a rainy day. You can bake a cake for a sunny day party.

Oh! A sunny day party is fun. We can make pretty things for a party.

Good night. Good night, little squirrels.

Look! The sun is out. Now we can have a sunny day party.

We will fix our tree for the party. Oh! How pretty it will look.

Dear friends, come to a sunny day party at two o'clock at Squirrel Tree.

Oh! What fun! The squirrels are having a sunny day party.

Be good little bunnies. Say "please" and "thank you."

Hurry! Hurry to the party.

Hello. Come up. Come up to the sunny day party.

Boo-hoo-hoo! Bunnies cannot hop up into a tree. We cannot go to the sunny day party. Boo-hoo-hoo!

Do not cry, little bunnies. You can come up to the party.

ORAL READING SAMPLE -- MONTH 3, BASAL

THE BIG, BAD DOG

What a day, what a day! Let me tell you.

When I went down the street, I met that dog. That dog was big and bad. That big, bad dog looked at me. I looked at that dog. But that dog was as big as this building. And I am just a little girl.

Let me tell you. That dog ran after me. I ran fast, and that dog ran fast.

I ran as fast as a car. I ran as fast as a truck. I ran as fast as a plane.

But I did not run as fast as that dog. He ran as fast as a rocket!

And then . . .

Let me tell you. That dog got to me in a flash. And then that big, bad dog jumped on me, and down I went!

Let me tell you. That big, bad dog sat on me. Yes, he sat on me!

And that was no fun for me, let me tell you.

Let me tell you. I was thinking, "Is this dog hungry?"

Just then his mother came to look for him. His

mother was a dog, but she was a good dog. She made that big, bad dog get up.

Then he went away with his mother. And I went to look for my mother. And that was some day. Let me tell you!

ORAL READING SAMPLE -- MONTH 3, SUPPLEMENTARY

JOHNNY LION'S BOOK

One day Mother Lion said to Father Lion, "Johnny can read."

"Oh, really?" said Father Lion.

"Yes, really," said Mother Lion.

"I am going out to buy him a new book," said Mother Lion.

Mother lion went out to buy Johnny a new book. She looked and looked. At last she found a book about a baby lion. The book was called The Little Lion.

Mother Lion took the book home to Johnny. Johnny was very happy to have a book that he could read all by himself when his mother and father went out hunting.

"Be a good little lion," said Mother Lion. "Do not go out of the house."

"Oh, no," said Johnny Lion. "I will not go out of the house. I will read my book all day long."

"Good-bye," said Mother Lion.

"Good-bye," said Father Lion. "We will bring you something to eat."

Mother and Father Lion went away.

Johnny Lion sat down to read. At first he did not read very well. He tried and tried, until he could read the story.

Once there was a mother lion and a father lion and a baby lion.

"Just like me," said Johnny Lion. "Only I am not a baby."

The baby lion's name was Oscar P. Lion.

"Oh," said Johnny, "What a nice name for a baby."

One day Oscar P. Lion's mother and father went out hunting. The baby lion stayed at home to play.

ORAL READING SAMPLE -- MONTH 4, BASAL

NO CATS

What a day, what a day! Let me tell you.

I was in my bed. And this cat came in. I did not ask the cat to come in. I did not bring it in. It just came in.

Let me tell you. I said to this cat, "Go away, cat! No cats in this apartment. No cats in this building!"

But this cat did not go away. It jumped up on my bed and sat down. It looked at me and said, "I came to see you. I like you."

The cat said that to me.

And then . . .

Let me tell you. My dad came in. He asked me, "Did you see a cat?"

I said, "A cat? A little cat? A little, black cat? A little, black cat, just this big?"

And my dad said, "Yes! A little, black cat just that big!"

Let me tell you. That cat hid in my bed. I was going to tell my dad about that cat. But just then, the cat jumped up. In a flash, my dad got it.

"Back to the street you go!" he said. "No cats in this apartment. No cats in this building."

So that was that. And I went to sleep. And so . . .

Let me tell you. And in that day . . .

A big, bad dog sat on me. Billy and I had a plane ride. And a cat hid in my bed.

It was some day. Let me tell you!

ORAL READING SAMPLE -- MONTH 4, SUPPLEMENTARY

GORDON GOES CAMPING

Gordon sat in his favorite chair, reading a book. It was a good book. It was about camping in the woods.

Gordon's friend Marvin was visiting him.

"Marvin," said Gordon, "I am going to go camping in the woods."

"Oh my," said Marvin. "Then you will need a warm coat and a hat and sturdy shoes."

Gordon went to his closet. He got out his warmest coat and hat. He got out his sturdiest shoes.

"Now am I ready to go camping?" he said.

"Oh no," said Marvin. "You will need pots and pans for cooking."

So Gordon went to the kitchen. He got plenty of pots and pans from the cupboard.

"Now am I ready?" he said.

"Not yet," said Marvin. "You will need a flashlight to see in the dark."

Gordon went to the cellar. He got the brightest flashlight he could find.

"Am I ready now?" he said.

"Oh no," said Marvin. "It will be cold in the woods. You will need plenty of warm blankets."

So Gordon went to the linen closet. He took out all the blankets.

"Now am I ready, please?" he said.

"Not yet," said Marvin. "You will need lots and lots of food to eat."

Gordon went back to the kitchen. He took bread from the breadbox. He took apples from the fruit bowl. He took ham and cheese and peanut butter and jelly. He took a box of crackers and a bottle of milk.

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APPENDIX B

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The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

4/20/82
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